Environ. Chem. **2016**, *13*, 971–978
doi:10.1071/EN16078_AC

Supplementary material

A BUKI (Building up Knowledge Initiative) focused on antimony's environmental chemistry

Montserrat Filella[A,B]

[A]Institute F.-A. Forel, University of Geneva, Boulevard Carl-Vogt 66, CH-1211 Geneva 4, Switzerland.

Email: montserrat.filella@unige.ch

[B]SCHEMA, Rue Principale 92, L-6990 Rameldange, Luxembourg.

doi:10.1071/EN16078_AC

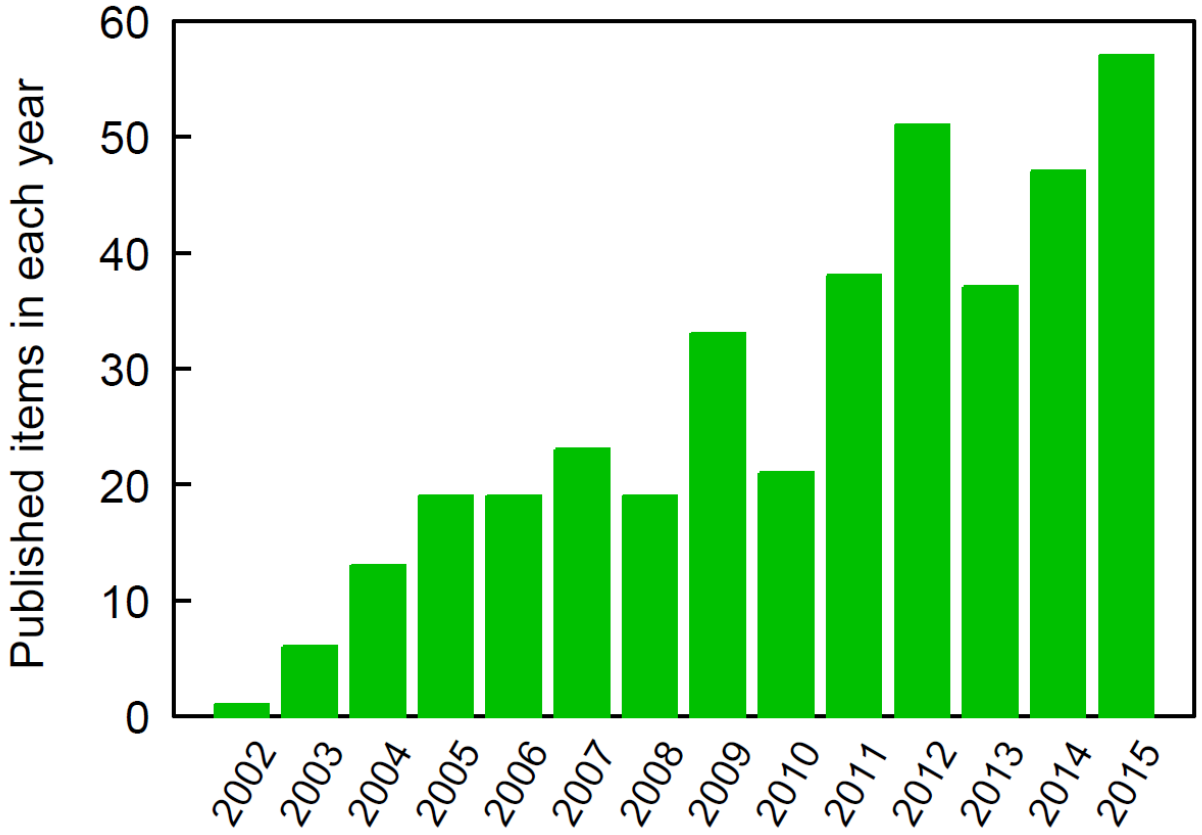

Figure S1 Citation history of the most cited review on antimony in the environment from its publication to end of 2015. Source: ISI Web of Knowledge[SM].

doi:10.1071/EN16078_AC

Method

Citation networks were constructed from the author's antimony literature database (more than 3500 articles), continuously updated through queries to the ISI Web of Knowledge[SM]. This was complemented by a manual snow ball procedure. All papers were read and, when possible, results confirmed by search of key words and sentences in pdf files. The objective of the work is not to get an exhaustive review of all existing literature but rather to adequately reflect citation practices.

It is acknowledged that, when there is more than one statement in the same sentence, it is not possible to know to which statement the references refer to.

The structure of the tables containing the results is similar. The first column shows the literal citation in brackets. Observations and comments are highlighted in grey. When useful, key words or sentences appear in yellow. The other columns show first the reference of the article, then the articles cited and, finally, of those that cite it. For the sake of clarity, articles are identified by using an abbreviation system commonly used in databases and do not follow the journal citation rules.

In a very few cases (five), it has not been possible to access the original articles. They appear highlighted in pale red in the tables and in the list of references.

Environ. Chem. **2016**
doi:10.1071/EN16078_AC

Table S1. Papers published in the period 2009-2015 containing the statement "Sb(III) is ten times more toxic than Sb(V)"

Papers are ordered first chronologically and then alphabetically for each year. For each paper, the original text and citations are given. Square brackets are used to indicate the numbering of the reference in the original source paper when necessary. Papers published before 2009 are only given when they have been cited. Comments are shaded in grey

Original text	Reference	Articles cited	Articles that cite this article
"The inorganic species are more toxic than the organic forms, and the trivalent state is approximately ten times more toxic in comparison to Sb(V) (Smichowski, Madrid, and Cámara 1998; Smichowski 2008)"	**2015GON_TAD**	1998SMI_MAD 2008SMI	
"Both species are toxic, but Sb(III) is 10 times more toxic than Sb(V).[2]"	**2015LUO_LUO**	2011AMA_WU	
"Sb^{3+} is 10-fold more toxic than Sb^{5+} (Wang et al. 2015; Anjum and Datta2012; Guo, Wu, and He 2009)."	**2015MUB_CHA**	2015WAN_WAN 2012ANJ_DAT 2009GUO_WU	
"and the reduced inorganic species Sb^{III} being 10 times more toxic than the oxidized Sb^{V} species [6]."	**2015TIS_REN**	2008SMI [6]	
"Sb(III) is 10 times more toxic than Sb(V) [2]".	**2015WAN_WAN**	2012WU_SUN	2015MUB_CHA
"Sb(III) is regarded as 10 times more toxic than Sb(V) [19,20]."	**2014DOR_AMA**	1998LIN_MIC [19] 2010JIA_WEN [20]	
"Sb(III) is known to be 10 times more toxic than Sb(V) [5]."	**2014FAN_TAN**	1998SMI_MAD [5]	
"Generally, inorganic antimony is more toxic than organic antimony, being that the trivalent species is 10 times more toxic than pentavalent species." (…) "Generally, antimony compounds are 10 times less toxic than arsenic compounds, but it depends also in the oxidation state and chemical structure [1]."	**2014FER_DOS**	No references (…) 2005COR [1]	

"Sb (III) appears to be ten times more toxic than Sb (V), while methylated Sb appears to be the least toxic (Wilson et al. 2010)." The reference given concerns methylated Sb.	**2014GUI_CAL**	No references
"The toxicity of antimony species is similar to arsenic with trivalent compounds being ten times more poisonous than pentavalent species [10]."	**2014GUO_WU**	1994GUR_SHA
"Sb(III) is very interesting for speciation analysis as it is 10 times as toxic as Sb(V) [8–13]."	**2014JAB_SZO**	2010POP_HAN [8] 1999KAB_PEN [9] 2002FIL_BELa [10] 2008MAR_ATT [11] 1996LEO_GER [12] 2000GAR_BUL [13]
"Sb(III) has been reported to be about 10 times more toxic than Sb(V) (Filella et al., 2002)"	**2014NAK_ALT**	2002FIL_BELa
"Meanwhile, the toxicity of Sb(III) is reported to be 10 times greater than that of Sb(V) [12,13]."	**2014SHA_MA**	1998SMI_MAD [12] 2001KRA_EMO [13]
"with SbIII being 10 times more toxic than SbV (Smichowski, 2008)."	**2014TIS_LES**	2008SMI
"Sb(III) compounds are ten times as toxic as Sb(V) compounds [2,3]."	**2013AME_MEI** **predatory journal**	1998GUY_JON [2] 2007FIL_BEL [3]
"Furthermore, Sb(III) is 10 times more toxic than Sb(V) [16] so detection of total antimony is not sufficient to assess toxic effects."	**2013COS_ROM**	2002FIL_BELa
"Sb(III), for example, is reported to be 10 times more toxic than Sb(V) [2]"	**2013IQB_SAE**	1998SMI_MAD [2]
"The toxicity of Sb(III) ions is 10 times higher than Sb(V) ions [9–11]."	**2013MEN_BAR**	1993SHA_PAT [9] 2003SAR_SOY [10] 2004OZD_SOY [11]

"Elemental antimony is more toxic than its salts, and Sb(III) compounds are more toxic than Sb(V) compounds by a factor of 10.	**2013ROJ_ARA**	No references	
"the Sb(III) form, for example, is ten times more toxic than the Sb(V) form (Gurnani et al., 1994; Gebel, 1997; Oorts et al., 2008; Smichowski et al., 1998a, 1998b)." Error: the two refs by Smichowski are the same.	**2013SAL_MOH**	1994GUR_SHA 1997GEB 2008OOR_SMO 1998SMI_MAD	
"The toxicity of Sb(III) compounds is of 10 times more than Sb(V) compounds [1]."	**2013SON_ZHA**	2008SMI [1]	
"and the toxicity of Sb(III) is 10 times greater than that of Sb(V) [3–5]."	**2013WEN_ZHU**	1998POO_CHU [3] 2009GON_CER [4] 2008SMI [5]	
"trivalent Sb compounds exert 10 times' higher acute toxicity than pentavalent Sb species"	**2013XI_HE**	2001KRA_EMO	
"Of both forms Sb (III) is known to be more toxic than Sb (V) and is predominant in ground waters." but no mention to "10 times".	**2012ANJ_DAT** **predatory journal**		2015MUB_CHA
"In general, antimonite (SbIII) is ten times more toxic than antimonate (SbV), and inorganic Sb species are more toxic than organic species (10–11)."	**2012GE_WEI**	2002FIL_BELa [10] 1997GEB [11]	
"The trivalent inorganic forms of antimony are the most common species, and are known to be 10 times more toxic than pentavalent one [4,6]."	**2012LEN_GUO**	2011AMA_WU [4] 2009NAM_YAN [6]	
"The Sb(III) compounds have ten times higher acute toxicity than the Sb(V) species [7]."	**2012WU_SUN**	2001KRA_EMO [7]	2015WAN_WAN
No mention to Sb(III) vs. Sb(V) toxicity.	**2011AMA_WU**		2015LUO_LUO 2012LEN_GUO
"and trivalent antimony salts are 10 times more toxic than pentavalent salts [4]." Error in reference 2008SUN_SIN. It is 1998SUN_SIN.	**2011GAD_SAN**	2008SUN_SIN [4]	

"Furthermore, Sb(III) has a toxicity ten times higher than Sb(V) does [9]."	**2011XU_WAN**	1998SMI_MAD [9]	
"Inorganic antimony compounds are more toxic than organic antimony compounds, and Sb(III) is ten times more toxic than Sb(V) [1]."	**2011QUI_OLI**	1998GUY_JON [1]	
"The toxicity of Sb(III) is 10 times higher than that of Sb(V) [2]."	**2011ZEN_YAN**	1995KEN_LEI [2]	
"Sb(III) components are claimed to exert 10 times higher toxicity than Sb(V) components (Fowler and Goering, 1991)."	**2010DUA_SON**	1991FOW_GOE	
"The toxicity of antimony(III) ion is 10 times higher than that of antimony(V) ion, and antimony(III) has been shown to cause lung cancer [4,5]."	**2010JIA_WEN**	2003SAR_SOY [4] 1998POO_CHU [5]	2014DOR_AMA
"… with the trivalent Sb(III) being the more toxic form." but no mention to "10 times".	**2010POP_HAN**		2014JAR_SZO
"The Sb(III) form is ten times more toxic than Sb(V) form [10]."	**2010SAR_CIT**	1998SMI_MAD [10]	
"Sb(III) form is 10 times more toxic than Sb(V) form [11]."	**2010ULU_SAR**	1998SMI_MAD [11]	
"Specifically, antimony (III) is reported to be 10 times more toxic than Sb(V) [14–17]."	**2010WU_HE**	1994GUR_SHA[14] 1997GEB [15] 2008OOR_SMO [16] 1998SMI_MAD [17]	
"Sb(V) is ten times more toxic than Sb(III) [6]."	**2009CER_AMA**	2001KRA_EMO [6]	
"The inorganic species are the most toxic ones, whereby the toxicity of Sb(III) is ten times higher than that of Sb(V) [1,2]."	**2009FER_FER**	2008SMI [1] 2007FIL_BEL [2]	
"Generally, inorganic antimony is more toxic than organic species, with Sb(III) being 10 times more toxic than Sb(V)."	**2009GON_CER**	No references	2013WEN_ZHU
"Sb(III), for example, is reported to be 10 times more toxic than Sb(V) (Smichowski et al., 1998)."	**2009GUO_WU**	1998SMI_MAD	2015MUB_CHA

"Elemental Sb is more toxic than its salts, and generally trivalent Sb compounds exert a ten times higher acute toxicity than pentavalent Sb species [2] and might cause lung cancer and stibine is a highly toxic gas that can cause both serious injury to the central nervous system and hemolysis."	**2009MAD_BOZ**	1995KEN_LEI [2]	
"The toxicity of Sb also depends on the oxidation state; Sb(III) compounds have 10 times higher acute toxicity than Sb(V) species [1]."	**2009MIT_TAK**	2001KRA_EMO [1]	
"the trivalent species are known to be more toxic than pentavalent one" but no mention to "10 times".	**2009NAM_YAN**		2012LEN_GUO
"Determination of total antimony is not sufficient to evaluate its toxic effect in seawater, indeed, inorganic Sb(III) is 10 times more toxic than inorganic Sb(V) and inorganic species of antimony are more toxic than the organic ones [1]."	**2009PEN_LAV**	2002FIL_BEL a [1]	
"Sb(III) is considered to be more toxic than Sb(V)"[1]" but no mention to "10 times".	**2008MAR_ATT**		2014JAR_SZO
"Antimony is a nonessential element and Sb(III) is reported to be about ten times more toxic in solution than Sb(V) [2]."	**2008OOR_SMO**	2002FIL_BEL [2]	2013SAL_MOH 2010WU_HE
"Sb(III) compounds are about 10 times more toxic than Sb(V) species."	**2008SMI**	No references	2015GON_TAD 2015TIS_REN 2014TIS_LES 2013SON_ZHA 2013WEN_ZHU 2009FER_FER
Cardiotoxicity in relation to kala-azar patients treated with sodium antimony gluconate. No mention of "ten times".	**1998SUN_SIN**		2011GAD_SAN
"Experimental and clinical trials with compounds containing antimony have shown that the trivalent compounds are generally more toxic than the pentavalent compounds (Winship, 1987; Gebel, 1997; WHO, 2006)." No mention to "10 times".	**2007FIL_BEL**		2013AME_MEI 2009FER_FER
"Trivalent Sb has a toxicity that is 10 times higher than that of pentavalent Sb (5)."	**2005COR**	1991FOW_GOE	2014FER_DOS

"The toxicity of Sb(III) ions is 10 times higher than of Sb(V) ions, hence the importance of the separate determination of these two ions [7, 8]."	**2004OZD_SOY**	1993SHA_PAT [7] 2003SAR_SOY [8]	2013MEN_BAR
"The toxicity of Sb(III) is ten-times higher than that of Sb(V) [1-3]." Reference 2 is wrong	**2003SAR_SOY**	1977LUC_VEN [1] 1999HOU_NAR [2] 1976STE [3]	2013MEN_BAR 2010JIA_WEN 2004OZD_SOY
"Trivalent species are reported to be more toxic than pentavalent forms [Bencze, 1994]" No mention to "10 times".	**2002FIL_BELa**		2014JAB_SZO 2014NAK_ALT 2013COS_ROM 2012GE_WEI 2009PEN_LAV
"Sb(III) compounds in general are claimed to exert a 10-times higher toxicity than pentavalent Sb compounds."	**2001KRA_EMO**		2014SHA_MA 2013XI_HE 2012WU_SUN 2009CER_AMA 2009MIT_TAK
No mention to Sb(III) vs. Sb(V) toxicity.	**2000GAR_BUL**		2014JAB_SZO
	1999KAB_PEN		2014JAB_SZO
"SbIII compounds can be as much as 10 times more toxic than SbV compounds, with the highly toxic SbH_3 being the most poisonous. [10]"	**1998GUY_JON**	1988IFF	2013AME_MEI 2011QUI_OLI
"Since Sb(II1) compounds are more toxic than Sb(V) ones and…" but no mention to "10 times".	**1998LIN_MIC**		2014DOR_AMA
No mention to "10 times".	**1998POO_CHU**		2013WEN_ZHU 2010JIA_WEN

"Toxicity of Sb(III) has been shown to be 10 times higher than that of Sb(V)." "Inorganic species of antimony are more toxic than the organic ones and Sb(III) is ten times more toxic than Sb(V) [8]."	**1998SMI_MAD**	1976STE [8]	2015GON_TAD 2014FAN_TAN 2014SHA_MA 2013IQB_SAE 2013SAL_MOH 2011XU_WAN 2010SAR_CIT 2010ULU_SAR 2010WU_HE
Nowhere is mentioned that Sb(V) is more toxic than Sb(III), even less that it is 10 times more toxic	**1997GEB**		2013SAL_MOH 2012GE_WEI 2010WU_HE
Review on mutagenicity, carcinogenicity and teratogenicity of Sb compounds. No mention of "10 times"	**1996LEO_GER**		2014JAB_SZO
Nowhere is mentioned that Sb(V) is more toxic than Sb(III), even less that it is 10 times more toxic	**1995KEN_LEI**		2011ZEN_YAN 2009MAD_BOZ
"Trivalent compounds of Sb have been reported to be more toxic than pentavalent ones (58, 202)." but no mention to "10 times".	**1994GUR_SHA**		2014GUO_WU 2013SAL_MOH 2010WU_HE
"Antimony (III) is more toxic than antimony(V) [1]". but no mention to "10 times".	**1993SHA_PAT**		2013MEN_BAR 2004OZD_SOY
'Trivalent antimonials are generally more toxic than pentavalent forms" but nowhere is found the statement that Sb(III) is 10 times more toxic than Sb(V)	**1991FOW_GOE**		2010DUA_SON 2005COR

No mention found on organic/inorganic relative toxixity.	**1988IFF*** **(1988SEI_SIG)**	1998GUY_JON
No mention of Sb(III) vs Sb(V) toxicity.	**1977LUC_VEN**	2003SAR_SOY
Although the fact that Sb(III) is more toxic than Sb(V) is cited in the Toxicity section (no citations), nowhere is found in this article the statement that Sb(III) is 10 times more toxic than Sb(V)	**1976STE**	2003SAR_SOY 1998SMI_MAD

*This reference is cited often as Seiler et al. (1988).

Environ. Chem. **2016**
doi:10.1071/EN16078_AC

Table S2. Papers published up to 2015 including a statement of the type "The toxicity of antimony is similar/comparable/analogous to that of arsenic"

Papers are ordered chronologically and then alphabetically for each year. For each paper, the original text and its citations are given. Square brackets are used to indicate the numbering of the reference in the original source paper. The comparative term used is highlighted in yellow. Comments are shaded in grey.

Original text	Reference	Articles cited	Articles that cite this article
"Even at low concentrations, Sb is considered potentially toxic, and is a non-essential element (Smichowski 2008) with chemical and toxicological properties comparable to arsenic compounds (Flores et al. 2002)."	**2015GON_TAD**	2002FLO_SAN	
"The environmental toxicity of Sb compounds is understood similar to As."	**2015MER_RUB**	No references	
"Arsenic and antimony are both metalloids (…) These trace elements with similar chemistry and toxicity are naturally occurring and commonly present together (An and Kim, 2009; Lehr et al., 2007)."	**2015UNG_SAN**	2009AN_KIM 2007LEH_KAS	
"The toxicity of Sb is assumed to be similar to that of As with respect to its effects and mechanism (Buschmann and Sigg, 2004)."	**2015WAN_ZHA**	2004BUS_SIG	
"its chemical and toxicological properties are similar to arsenic."	**2014ANS_KLA**	No references	
"Antimony (Sb) is a metalloid element and it shares similar toxicity and chemical nature with arsenic"	**2014DOR_AMA**	No references	
"The toxicity of antimony species is similar to arsenic with trivalent compounds being ten times more poisonous than pentavalent species [10]."	**2014GUO_WU**	1994GUR_SHA [10]	
"Although there is a scarcity of peer-reviewed studies that document the extent of Sb ecotoxicity and its environmental behavior, the toxicology and geochemistry of Sb are generally thought to be analogous to that of As.[14]	**2014KUL_MIL**	2009FIL_WIL [14]	
"Antimony also has highly toxic properties similar to arsenic."	**2014NAK_ALT**	No references	

"Water-soluble Sb is comparable in its toxicological behavior to arsenic (As), hence trivalent species are more toxic than pentavalent ones (Gebel, 1997)."	**2013PAO_FIO**	1997GEB	
"Antimony is a proven carcinogen and is comparable to arsenic in toxicity and chemical properties [8]."	**2012WU_SUN**	2008WES_PRA [8]	
"Moreover, antimony is a toxic bioaccumulative element with similar chemical and toxicological properties to arsenic, and moderate levels of them may lead to bioavailability and harmful environmental effects."	**2010DUA_SON**	No references	
"Similar to As, Sb is a chalcophilic group V metalloid, and is assumed to have a comparable geochemical behavior and toxicity (Gebel, 1997; Wilson et al., 2004; Tighe et al., 2005)".	**2010FU_WU**	1997GEB 2004WIL_CRA 2005TIG_ASH	
"It is commonly assumed that antimony is similar to arsenic in both chemical behavior and toxicity (Fowler et al. 1991)."	**2010LIU_LE**	1991FOW_GOE	
"The toxicity of antimony is assumed to be similar to that of arsenic with respect to effects and mechanism (Gebel, 1997)".	**2010XI_HE**	1997GEB	
"Antimony (Sb) is a naturally occurring metal in the earth's crust (e.g. stibinite, Sb_2S_3), and commonly present with arsenic (Lehr et al., 2007).	**2009AN_KIM**	2007LEH_KAS	2015UNG_SAN
No mention of As toxicity; no comparison of As and Sb toxicity.	**2009FIL_WIL**		2014KUL_MIL
"Both elements and their species are also comparable in toxicity [6]."	**2009MUL_DAU**	1998GEB_SUC [6]	
"Sb belongs to the group of non-essential elements and its toxicity is comparable to arsenic and bismuth."	**2009PAN_LIU**	No references	
"The toxicity of inorganic Sb is assumed to be similar to that of As and also depends on the oxidation state; Sb(III) is more toxic than Sb(V) (Picard and Bosco, 2003)."	**2008MIT_TAK**	2003PIC_BOS	
"Antimony has toxic properties similar to arsenic."	**2008NAK_SEK**	No references	
"However, research shows that antimony and arsenic, a proven carcinogen, are similarly toxic [Gebel, 1997]."	**2008WES_PRA**	1997GEB	2012WU_SUN

"It is generally assumed that the geochemical behaviour and toxicity of Sb are similar to those of arsenic (As) [Wilson et al., 2004; Tighe et al., 2005a,b].	**2007ETT_MIH**	2004WIL_CRA 2005TIG_ASH 2005TIG_LOC	
"Chemical and toxicological properties of Sb are similar to those of As."	**2007KAB_MUK**	No references	
"Sb is typically found with arsenic (As), another group V element having similar chemistry and toxicity." (Introduction) "Therefore, despite the literature suggesting that Sb(III) and As(III) may be biochemical analogs, Sb(III) oxidation is catalyzed by a pathway different than that used for As(III)."(Abstract)	**2007LEH_KAS**	No references	2015UNG_SAN 2009AN_KIM
"It is a non-essential element for life, and it has chemical and toxicological properties similar to that of arsenic [3]."	**2007PAC_GIL**	2006LI_HU [3]	
"Also they have similar chemical and toxicological properties and they can cause cancer in trivalent state [1]."	**2007YER_ERD**	1997GEB	
"Antimony, which is considered a nonessential element, is comparable in its toxicological behavior to arsenic and bismuth [163]." The reference is a previous edition of the same encyclopedia but it is incomplete.	**2006GRU_HAN**	ULL [163]	
"Antimony is considered to be toxic and carcinogenic in a manner similar to arsenic [Gebel, 1997]."	**2006KEL_ALE**	1997GEB	
"Nevertheless, antimony is a cumulative toxic element and it has chemical and toxicological properties similar to those of arsenic [2]."	**2006LI_HU**	1997GEB	2007PAC_GIL
"The toxicity of inorganic Sb is assumed to be similar to that of As and also depends on the oxidation state; Sb(III) is more toxic than Sb(V) [5]".	**2006MIT_HAR**	2003PIC_BOS [5]	
"The toxicity of Sb is thought to be similar to that of As."	**2006SCH_ROS**	No references	
"Antimony is in the group of non-essential elements and its toxicity is comparable in behavior to arsenic and bismuth."	**2005ABB_BAR**	No references	

"Toxicity of antimony is assumed to be similar to that of arsenic, with respect to effects and mechanism [4, 5]."	**2005BUS_CAN**	1998CAI_SAL [4] 1997GEB [5]	
"No biological function jas yet been found for Sb, and its toxicity to animals is comparable to that of As and Pb."	**2005SHO_KRA**	No references.	
"In comparison with As, there is a dearth of information on the ecotoxicology of Sb and the extent of its environmental dispersion, cycling, and chemistry in heterogeneous field systems." "Similar to As, evidence suggests toxicity and availability of Sb depends on its speciation (Gebel, 1997; Smichowski et al., 1998; Filella et al., 2002)." References not considered, different subject	**2005TIG_ASH**	No references	2010FU_WU 2007ETT_MIH
This paper does not contain any mention to As or Sb toxicity	**2005TIG_LOC**		2007ETT_MIH
"Also they (arsenic and antimony) have similar chemical and toxicological properties and they cause cancer in trivalent state [1]."	**2005YER_ERD**	1997GEB [1]	
"The toxicity of antimony is assumed to be similar to that of arsenic with respect to effects and mechanism (5, 6)"	**2004BUS_SIG**	1998CAI_SAL [5] 1997GEB [6]	2015WAN_ZHA
"Antimony is similar to arsenic in toxicity to animals [18]."	**2004CRA_WIL**	1994GUR_SHA [18]	
"Nevertheless, antimony is a toxic cumulative element with similar chemical and toxicological properties to arsenic [3]."	**2004MIR_LOPa**	1997GEB [3]	
"Nevertheless, antimony is a cumulative element with similar chemical and toxicological properties to arsenic [2]."	**2004MIR_LOPb**	1997GEB [2]	
"Arsenic is considered to be toxic and carcinogenic in a similar way to antimony (Gebel, 1987) and is currently regarded as one the most serious inorganic drinking water pollutants in the world."	**2004WIL_CRA**	1997GEB	2010FU_WU 2007ETT_MIH
"Antimony is in-group of non-essential elements and its toxicity is comparable in behavior to arsenic and bismuth."	**2003ABB_NAJ**	No references	

"Antimony (Sb) is a Group V element that is similar to arsenic in many aspects of chemical behaviour and toxicity to animals [Gurnani et al., 1994; WHO, 1996; Filella et al., 2002].	**2003ASH_CRA**	1994GUR_SHA 1996WHO 2002FIL_BEL	
"Antimony has chemical and toxic properties similar to those of arsenic; however, the carcinogenic effect of antimony is not completely understood [1]."	**2003FUE_PINa**	1994GUR_SHA [1]	
"Antimony, a nonessential element for animals and plants, it is a cumulative toxic element that has chemical and toxicological properties similar to those of arsenic [1-2]."	**2003FUE_PINb**	1997GEB [1] 1997WEY_RIC [2] 1994GUR_SHA	
"The environmental monitoring of antimony is of growing interest; it is a non-essential element that has chemical behavior and toxicity similar to those of arsenic [16].	**2003GRE_FUE**	1997GEB [16]	
No comparison of As and Sb toxicity.	**2003PIC_BOS**		2008MIT_TAK 2006MIT_HAR
"Although the biogeochemical behavior of Sb is poorly studied, there is some evidence that it is similar to As and P [Adriano, 2001]."	**2003WAG_PER**	2001ADR	
The only related statement found in the paper is "Antimony has no biological function and, like arsenic, it is toxic."	**2002FIL_BELa**		2003ASH_CRA
"Antimony is a non-essential element and its compounds have toxicities similar to arsenic compounds [1]."	**2002FLO_SAN**	1991FOW_GOE [1]	
"Generally, the inorganic species of antimony are more toxic than the organic ones – toxicity and chemical behavior are similar – and they may even perhaps be more toxic than the analogous arsenic species [1]."	**2002SAY_BEL**	1993LAU_HOE [1]	
"Since the geochemical behavior of Sb is similar to that of As, it is commonly associated with nonferrous deposits and therefore, is emitted to the environment during the smelting of these ores" but no comment relating the toxicity of both elements.	**2001ADR**		2003WAG_PER

"Although the studies on Sb speciation are limited, it has been clearly shown that the toxicity of Sb species is similar to that of arsenic with Sb(III) being much more poisonous than Sb(V) (Gurnani et al., 1994)."	**2001BEL_CHE**	1994GUR_SHA	
"Nevertheless, antimony is a cumulative toxic element that has chemical and toxicological properties similar to those of arsenic [3].	**2001GRE_PIN**	1997GEB [3]	
"Antimony is a heavy element and its toxicity is comparable to arsenic."	**2000CRA_FOR**		
"Chemical behaviour and toxicity of antimony are similar to that of arsenic [2]."	**2000KAN_KAW**	1991FOW_GOE [2]	
"These inorganic species of antimony are more toxic than organic compounds, the toxicity and chemical behaviour of antimony being similar and even perhaps more toxic [3, 4] than that of arsenic."	**2000SAY_BEL**	1993SAU_HOE [3] 1979ELI_FRI [4]	
"It was reported that antimony is a non-essential elements in plants, animals and humans; its toxicity is similar to that of arsenic, and is perhaps even more toxic [9]."	**2000ZHE_OHA**	1979ELI_FRI [9]	
"Studies on Sb speciation are rather scarce but it is known that the acute toxicity of Sb species is similar to that of arsenic with Sb(III) being much more poisonous than Sb(V) [3]".	**1999BEL_CHE**	1990THA_PIC [3]	
Study on operons encoding homologous As-resistance determinants (*ars*). No clear why it was cited here.	**1998CAI_SAL**		2005BUS_CAN 2004BUS_SIG
Study on geogenic exposure to As and Sb.	**1998GEB_SUC**		2009MUL_DAU
"Antimony is one of the toxic elements which should be focused on. Its chemical behaviour and toxicity are similar to that of arsenic [1].	**1998ULR**	1991FOW_GOE [1]	
"Chemically, Sb is similar to arsenic, and perhaps even more toxic [1-2]."	**1998ZHA_COR**	1993LAU_HOE [1] 1979ELI_FRI [2]	
"Biologically, As(III) is more toxic than As(V), and antimony is similar to arsenic in its toxicity [1, 2]."	**1997DEO_TAV**	1977FOW_GOY [1] 1984GAS_SMI [2]	

"Arsenic and antimony share some chemical and toxicological properties [1-3]. (…) There is little known about antimony to evaluate its toxicology and determine its impact on the environment and human health. (…) This short review compares the toxicological profiles of arsenic and antimony with respect to genotoxicity." (Introduction) "In spite of all these uncertainties, it can be assumed that environmental health issues are less for antimony than arsenic-for two reasons. First, human carcinogenicity with antimony has not been proved. Second, the environmental distribution is low" (Conclusions)	**1997GEB**	1986ELI_FRI [1] 1975LUC_VEN [2] 1988NOR_MAR [3]	2013PAO_FIO 2010FU_WU 2010XI_HE 2008WES_PRA 2007YER_ERD 2006KEL_ALE 2006LI_HU 2005BUS_CAN 2005YER_ERD 2004BUS_SIG 2004MIR_LOPa 2004MIR_LOPb 2004WIL_CRA 2003FUE_PINb 2003GRE_FUE 2001GRE_PIN
"Antimony, which is considered a nonessential element, is comparable in its toxicological behavior with arsenic and bismuth."	**1997MAE_FUK**	No references	
Toxicity study. No mention to As.	**1997WEY_RIC**		2003FUE_PINb
"The toxicological behaviour of antimony is similar to that of arsenic and bismuth, regarding antimony compounds in the oxidation state +3 are more poisonous than those in the oxidation state +5."	**1996WAG_SAN**	No references	
	1996WHO		2003ASH_CRA
"The toxicity of antimony compounds is similar to those of arsenic, trivalent compounds being more toxic than pentavalent ones [1]."	**1995CHW_ZMI**	1991FOW_GOE	

"Antimony, which is considered a non-essential element, is comparable in its toxicological behavior to arsenic and bismuth."	**1995DIE_REI**	No references	
"Antimony (Sb) belongs to subgroup VA of the periodic table together with arsenic, which it resembles both chemically and biologically [50]. (…) The toxic action of Sb on living systems is less than that of arsenic and more than bismuth within the subgroup VA." (1. Physical and chemical properties)	**1994GUR_SHA**	1979ELI_FRI [50]	2014GUO_WU 2004CRA_WIL 2003ASH_CRA 2003FUE_PINa 2003FUE_PINb 2001BEL_CHE
"Antimony, which is considered a nonessential element, is comparable in its toxicological behavior to arsenic and bismuth."	**1994MAE**	No references	
"The toxic effects of antimony compounds are similar to those of arsenic, trivalent compounds being more toxic than pentavalent ones [1-3]."	**1994ZMI**	1988IFF [1] 1987MCA [2] 1991FOW_GOE [3]	
No mention found to As and Sb toxicity.	**1993LAU_HOE**		2002SAY_BEL 1998ZHA_COR
"Comparable to arsenic in toxicity, antimony is thought to act by bonding irreversibly to thiol-containing enzymes, and it is known that antimony metabolism depends on its oxidation state."	**1992CAL_MAD**	No references	
"Comparable to arsenic in toxicity, antimony is thought to act by bonding irreversibly to thiol-containing enzymes, …."	**1991CAL_MAD**	No references	

"Antimony compounds show toxic properties similar to those of arsenic."	**1991FOW_GOE**	No references	2010LIU_LE 2002FLO_SAN 2000KAN_KAW 1998ULR 1995CHW_ZMI 1994ZMI
"Antimony has similar toxic properties to arsenic, and is considered the more toxic in both acute and chronic cases".	**1990FER**	No references	
No reference is made in this paper to As or Sb toxicity	**1990THA_PIC**		1999BEL_CHE
"Inorganic antimony compounds are very toxic (comparable to arsenic); their toxic effects are thought to result from irreversible binding to thiol-containing enzymes [26]."	**1989APT_HOW**	1980BER [26]	
"The toxic effects of antimony compounds are similar to those of the corresponding arsenic compounds".	**1988IFF**		1994ZMI
"The ressemblance of antimony to arsenic should be taken into consideration when evaluating the health effects of antimony to humans. Arsenic is a common contaminant of industrial grades of antimony and many of the symptoms of antimony exposure are similar to those of arsenic. The close chemical relationship between the two elements also indicates, however, similarities in biological effects".	**1988NOR_MAR**	No references	1997GEB
No mention found.	**1987MCA**		1994ZMI
"Antimony belongs to the same periodic group as arsenic, which it resembles both chemically and biologically. Arsenic is, however, much more toxic."	**1986ELI_FRI**	No references	1997GEB
	1984GAS_SMI		1997DEO_TAV
"No teratogenic effects have been reported for antimony, but soluble antimony salts are as acutely toxic as those of arsenic (Venugopal and Luckey, 1978)."	**1982GER_MAE**	1978VEN_LUC	
"Antimony(III) forms thioantimonates with sulfhydryl groups of cellular constituents". No mention of As.	**1980BER**		**1989APT_HOW**

"Antimony belongs to the same periodic group as arsenic, which it resembles both chemically and biologically." The authors modified this statement in the second edition of the book (1986) (see entry above). However, some articles, published after 1986, cited this old version as a proof that Sb might be "even more toxic" than As. A review by Gurnani et al. (1994) [1994GUR_SHA] copies literally this sentence.	**1979ELI_FRI**		2000SAY_BEL 2000ZHE_OHA 1998ZHA_COR 1994GUR_SHA
"Arsenic, the lightest metalloid of subgroup VA, is the most toxic for all species and all modes tested" (page 328) but "Soluble Sb salts are more toxic than similar Pb or As compounds"(page 214).	**1978VEN_LUC**		1982GER_MAE
	1977FOW_GOY		1997DEO_TAV
"Soluble antimony salts are considered to be more harmful than are similar lead or arsenic salts, but soluble antimony salts are few in number".	**1977LUC_VEN**		1997GEB
"Sb salts are considered more toxic than similar Pb or As salts".	**1975LUC_VEN**	No references	

Environ. Chem. **2016**
doi:10.1071/EN16078_AC

Table S3. Papers published up to 2015 including a statement of the type "inorganic antimony is more toxic than organic antimony"

Papers are ordered first chronologically and then alphabetically for each year. For each paper, the original text and citations are given. Square brackets are used to indicate the numbering of the reference in the original source paper when necessary. Mentions of actual compounds are highlighted in yellow

Original text	Reference	Articles cited	Articles that cite this article
"The inorganic components are considered more toxic than the organic ones, and the toxicity of Sb(III) has been shown to be stronger than that of Sb(V) for some organisms ([4], and references therein)."	**2015CID_BID**	2003BOE_KIR [4]	
"The inorganic species are more toxic than the organic forms, and the trivalent state is approximately ten times more toxic in comparison to Sb(V) (Smichowski, Madrid, and Cámara 1998; Smichowski 2008)"	**2015GON_TAD**	1998SMI_MAD 2008SMI	
" with inorganic species being more toxic than organic [8]"	**2015TIS_REN**	2000NAS_MAS [8]	
"Their inorganic forms are much toxic than organic forms (Gebel 1997; Filella et al. 2007; Oorts et al. 2008)."	**2015YAN_HE**	1997GEB 2007FIL_BEL 2008OOR_SMO	
"Generally, inorganic antimony is more toxic than organic antimony, being that the trivalent species is 10 times more toxic than pentavalent species."	**2014FER_DOS**	No references	
"Its inorganic form is more toxic than the organic form, with SbIII being 10 times more toxic than SbV (Smichowski, 2008)."	**2014TIS_LES**	2008SMI	
"In general, inorganic Sb compounds are found to be more toxic than organic Sb, and Sb(III) is more toxic than Sb(V) ((Filella et al. 2002b); (Okkenhaug et al. 2011))."	**2013FAN_WAN**	2002FIL_BELb 2011OKK_ZHU	

"Inorganic compounds of antimony are more toxic than the organic compounds [5–8]. "	**2013MEN_BAR**	2004FRA_KUE [5] 2001PYR [6] 2001KRA_EMO [7] 2007ZHA_MOR [8]	
"The toxicity of elementary Sb is stronger than its compounds and inorganic Sb has stronger toxicity than organic Sb."	**2013SON_ZHA**	No references	
"In general, antimonite (Sb^{III}) is ten times more toxic than antimonate (Sb^{V}), and inorganic Sb species are more toxic than organic species (10–11)."	**2012GE_WEI**	2002FIL_BELa [10] 1997GEB [11]	
"As for arsenic, the organic form of Sb is less toxic than inorganic species and its toxicity decreases from Sb (III) to (V) [3]."	**2012TSE_LIU**	2001KRA_SHO	
"In general, inorganic Sb compounds were found to be more toxic than organic ones, with Sb(III) more toxic than Sb(V) species (Filella et al., 2002b)"	**2011OKK_ZHU**	2002FIL_BELb	2013FAN_WAN
"Inorganic antimony compounds are more toxic than organic antimony compounds, and Sb(III) is ten times more toxic than Sb(V) [1]."	**2011QUI_OLI**	1998GUY_JON [1]	
"Inorganic compounds of antimony are more toxic than its organic forms."	**2011ZEN_YAN**	No references.	
"Organoantimonials (e.g. methylated species) < antimonates (Sb (V)) < antimonites (Sb (III)) (Gebel, 1997; He and Yang, 1999; Krachler et al., 2001; Filella et al., 2002a)."	**2010WIL_LOC**	1997GEB 1999HE_YAN 2001KRA_EMO 2002FIL_BELa	
"For example, inorganic Sb compounds are more toxic than organic Sb compounds and Sb(III) is known to be more toxic than Sb(V) (Gebel, 1999)."	**2009ACK_GIE**	1999GEB	
"Trivalent antimony is considered more toxic that pentavalent form and both species are more toxic than trimethyl-antimony [7,8]." Error in one reference. It is not 1991BOW_GOE but 1991FOW_GOE	**2009BEL_GOM**	1991BOW_GOE 1984LEF_GER	

"Generally, inorganic antimony is more toxic than organic species, with Sb(III) being 10 times more toxic than Sb(V)."	**2009GON_CER**	No references	
"The inorganic species are the most toxic ones, whereby the toxicity of Sb(III) is ten times higher than that of Sb(V) [1,2]."	**2009FER_FER**	2008SMI [1] 2007FIL_BEL [2]	
"Determination of total antimony is not sufficient to evaluate its toxic effect in seawater, indeed, inorganic Sb(III) is 10 times more toxic than inorganic Sb(V) and inorganic species of antimony are more toxic than the organic ones [1]."	**2009PEN_LAV**	2002FIL_BEL [1]	
"Similar to As, toxicity of Sb species decreases in the order inorganic SbIII >inorganic SbV >methylated Sb compounds.[5–10]"	**2009TEL_MAH**	2005SHO_KRA [5] 1997GEB [6] 1999HE_YAN [7] 2000LIN_PRA [8] 2001KRA_EMO [9] 2004OZD_SOY [10]	
"In general, inorganic Sb compounds were found to be more toxic than organic ones, and SbIII more than SbV species.[5]."	**2009TSC_ROB**	2002FIL_BELa [5]	
No mention of organic vs. inorganic toxicity.	**2008OOR_SMO**		2015YAN_HE
"Elemental antimony is more toxic than its salts and inorganic species of Sb are more toxic than the organic ones."	**2008SMI**	No references	2015GON_TAD 2014TIS_LES 2009FER_FER
"These two forms exhibit pronounced differences in their analytical behavior, toxicity and mobility [1]; inorganic compounds of antimony are more toxic than its organic forms; toxicity of Sb(III) has been shown to be 10 times higher than that of Sb(V)."	**2008TIT_KEN**	No references	
"The trivalent form is ten times more toxic than the pentavalent form, while the organic Sb species are less toxic, which is a similar behaviour to arsenic."	**2008ZIH_JAN**	No references	

Nothing in this article concerning organic/inorganic toxicity.	**2007FIL_BEL**		2015YAN_HE 2009FER_FER
"Similar differences exist between the toxicity of arsenic(III) and arsenic(V), and of antimony(III) and antimony(V). The (III) oxidation state is more toxic than the (V) state one, whereas organoarsenic and organoantimony compounds are the least toxic [2, 3]."	**2007HUA_HU**	1991MER [2] 1990FER [3]	
"Inorganic species of antimony are more toxic than the organic forms."	**2007WU_JIN**	No references	
"The toxicity of the different species of the same element is different, in which the inorganic compounds are more toxic than the organic compounds and the toxicity of As(III), Se(IV) and Sb(III) is stronger than that of As(V), Se(VI) and Sb(V) [1-3]."	**2007ZHA_MOR**	2001KRA_EMO [3]	2013MEN_BAR
"Inorganic compounds of antimony are more toxic than its organic forms."	**2006LI_HU**	No references	
"Inorganic species of antimony are more toxic than the organic ones, and antimonite, Sb(III), is ten times more toxic than antimoniate, Sb(V)."	**2006ROD_TYS**	No references	
"The toxicity of the element depends on the oxidation state, Sb(III) being more toxic than Sb(V), although its molecular form is also important, inorganic species being more toxic than organic compounds [2]."	**2006VIN_LOP**	1988SEI_SIG [2]	
"The toxicity of Sb depends on its molecular form: inorganic Sb compounds are more toxic than organic Sb compounds."	**2005AME_MEI**	No references	
"Unlike most other elements, antimony is more toxic than its organic compounds."	**2005GOM_DOM**	No references	
No clear mention to organic/inorganic toxicity.	**2005SHO_KRA**		2009TEL_MAH
Review on arsenic, no mention of antimony.	**2004FRA_KUE**		2013MEN_BAR
"Inorganic compounds of antimony are more toxic than its organic forms. This requires the determination of inorganic antimony as well as total antimony."	**2004OZD_SOY**	No references	2009TEL_MAH
"The toxicity of arsenic and antimony varies widely, ranging from highly hazardous inorganic species to relatively harmless organic species."	**2004SUN_QIA**	No references	
Nothing in this article concerning organic/inorganic toxicity.	**2003BOE_KIR**		2015CID_BID

"Inorganic species of antimony are more toxic than that of organic compounds [4]."	**2003SAR_SOY**	1998SMI_MAD [4]	
The paper does not contain any statement in relation to the toxicity of organic versus inorganic forms.	**2002FIL_BELa**		2012GE_WEI 2010WIL_LOC 2009PEN_LAV 2009TSC_ROB
The paper does not contain any statement in relation to the toxicity of organic versus inorganic forms.	**2002FIL_BELb**		2013FAN_WAN
"Generally, the inorganic species of antimony are more toxic than the organic ones – toxicity and chemical behavior are similar – and they may even perhaps be more toxic than the analogous arsenic species [1]."	**2002SAY_BEL**	1993LAU_HOE [1]	
"For example, inorganic species of antimony are more toxic than methylated ones, and Sb(III) is 10 times more toxic than Sb(V) [1]."	**2002YU_CAI**	2001KRA_EMO [1]	
"The inorganic species of antimony are more toxic than methylated ones, and Sb(III) is more toxic than Sb(V)."	**2001DAS_GUA**	No references	
Nothing found in this paper concerning organic/inorganic toxicity.	**2001KRA_EMO**		2010WIL_LOC 2009TEL_MAH 2007ZHA_MOR 2002YU_CAI 2013MEN_BAR
Nothing found in this paper concerning organic/inorganic toxicity.	**2001KRA_SHO**		2012TSE_LIU
This paper is on selenium, no mention of antimony.	**2001PYR**		2013MEN_BAR
Analytical paper.	**2000LIN_PRA**		2009TEL_MAH

No direct mention. Indirect: "The toxicity of antimony is largely dependent upon chemical speciation and the most toxic characteristics are displayed by the inorganic antimony (III) oxyanion".	**2000NAS_MAS**		2015TIS_REN
"These inorganic species of antimony are more toxic than organic compounds, the toxicity and chemical behaviour of antimony being similar and even perhaps more toxic [3, 4] than that of arsenic."	**2000SAY_BEL**	No references	
"Sb(III) is reported to be ten-times more toxic than Sb(V); generally, inorganic species are more toxic than organic ones [10]."	**2000ZHE_OHA**	1976STE [10]	
	1999GEB		2009ACK_GIE
Comparison of Sb(III) and Sb(V) effects on rice germination. No mention of organic/inorganic toxicity	**1999HE_YAN**		2010WIL_LOC 2009TEL_MAH
"On the basis of acute oral toxicity, the inorganic and trivalent forms of antimony appear more toxic than the organic or hexavalent forms [Venugopal and Luckey, 1978; Winship, 1987]."	**1999LYN_CAP**	1978VEN_LUC 1987WIN	
"SbIII compounds can be as much as 10 times more toxic than SbV compounds, with the highly toxic SbH_3 being the most poisonous. [10]"	**1998GUY_JON**	1988IFF	2011QUI_OLI
"Although there are more than 3000 organic compounds described in the literature, only two inorganic forms, Sb(III) and Sb(V), and two organic species, methylstibonic acid and dimethylstibinic acid, have been detected in natural waters. Inorganic species of antimony are more toxic than the organic ones and Sb(III) is ten times more toxic than Sb(V) [8]."	**1998SMI_MAD**	1976STE [8]	2015GON_TAD 2003SAR_SOY
Review on genotoxicity. No mention of organic/inorganic relative toxixity.	**1997GEB**		2015YAN_HE 2010WIL_LOC 2009TEL_MAH 2012GE_WEI

"In oxygenated waters the predominant species is Sb(V), although higher concentrations of Sb(III) and methylated compounds that would be expected from thermodynamic calculations have been detected. This could be attributed to microbial activity, which is suspected to favour such a transformation as a detoxification mechanism since the methylated species of antimony are less toxic than the inorganic ones." "Inorganic oxyanions are normally more toxic than organic compounds [4]."	**1995CAL_MAD**	1986CRA [4]	
"Inorganic species are more toxic than organic species."	**1995SMI_MAD**	No references	
No mention found on organic/inorganic relative toxixity.	**1993LAU_HOE**		2002SAY_BEL 2000SAY_BEL
No mention found on organic/inorganic relative toxixity.	**1991FOW_GOE**		2009BEL_GOM
The authors that cite this book do not give the corresponding page. The chapter of antimony is 1991FOW_GOE. No specific statement is found in this chapter on the toxicity of inorganic versus organic forms.	**1991MER**		2007HUA_HU
No mention found on organic/inorganic relative toxixity.	**1990FER**		2007HUA_HU
No mention found on organic/inorganic relative toxixity.	**1988IFF*** **(1988SEI_SIG)**		2006VIN_LOP
Conclusions do not mention organic/inorganic relative toxixity. In any case, 'organic' here could only mean sodium stibogluconate, tartrate, etc.	**1987WIN**		1999LYN_CAP
"Organic compounds of arsenic and antimony are less toxic than the inorganic oxyanions."	**1986CRA**	No references	1995CAL_MAD
Animals: "In peroral exposure, acute and chronic, antimony potassium tartrate is more toxic than antimony tri- and pentoxide [Flury, 1927; Bradley and Fredrick, 1941]."	**1986ELI_FRI**	1927FLU 1941BRA_FRE	
Toxicity study. Hamsters. Intratraqueal instillation of As_2O_3 and Sb_2O_3. They show different behaviour.	**1984LEF_GER**		2009BEL_GOM

Animals: "In peroral exposure, acute and chronic, antimony potassium tartrate is more toxic than antimony tri- and pentoxide [Flury, 1927; Bradley and Fredrick, 1941]."	**1979ELI_FRI**	1927FLU 1941BRA_FRE	2000SAY_BEL
"Organic Sb compounds are more toxic than similar As and Pb compounds".	**1978VEN_LUC**		1999LYN_CAP
"The symptoms occur more frequently during treatment with tartar emetic".	**1976STE**		1998SMI_MAD 2000ZHE_OHA
Toxicity study. Intraperitonally administered to guinea pigs: "The above findings establish a relatively low order of toxicity for the oxides and sulfides of antimony. (…) Antimony metal, however, presents a rather high order of toxicity. The high toxicity of tartar emetic, 10 times that of metal, long has been recognised". Metal was ground (325-mesh sieve) and suspended in corn oil.	**1941BRA_FRE**		1986ELI_FRI 1979ELI_FRI
Toxicity study. Rats, mice, dogs, cats. Oral administration. Antimony potassium tartrate is more toxic.	**1927FLU**		1986ELI_FRI 1979ELI_FRI

*This reference is cited often as Seiler et al. (1988).

doi:10.1071/EN16078_AC

References

Identifier	Reference
2015CID_BID	R.Cidu, R. Biddau, E. Dore, Determination of traces of Sb(III) using ASV in Sb-rich water samples affected by mining. *Anal. Chim. Acta* **2015**, *854*, 34–39.
2015GON_TAD	V. C. Gonçalves dos Santos, M. Tadeu Grassi, G. Abate, Speciation of antimony(III) and antimony(V) in bottled water by hydride generation-inductively coupled plasma optical emission spectrometry. *Anal. Lett.* **2015**, *48*, 18, 2921–2935.
2015LUO_LUO	J. Luo, X. Luo, J. Crittenden, J. Qu, Y. Bai, Y. Peng, J. Li, Removal of antimonite (Sb(III)) and antimonate (Sb(V)) from aqueous solution using carbon nanofibers that are decorated with zirconium oxide (ZrO_2). *Environ. Sci. Technol.* **2015**, *49*, 11115−11124.
2015MER_RUB	M. F. Mera, M. Rubio, C. A. Pérez, V. Galván, A. Germanier, SR μXRF and XRD study of the spatial distribution and mineralogical composition of Pb and Sb species in weathering crust of corroded bullets of hunting fields. *Microchem. J.* **2015**, *119*, 114–122.
2015MUB_CHA	H. Mubarak, L.-Y. Chai, N. Mirza, Z.-H. Yang, A. Pervez, M. Tariq, S. Shaheen, Q. Mahmood, Antimony (Sb) – pollution and removal techniques – critical assessment of technologies. *Toxicol. Environ. Chem.* **2015**, *97*, 1296–1318.
2015TIS_REN	R.Tisarum, J.–H. Ren, X. Dong, H. Chen, J.T.Lessl, L. Q. Ma, A new method for antimony speciation in plant biomass and nutrient media using anion exchange cartridge. *Talanta* **2015**, *144*, 1171–1175.
2015UNG_SAN	G. Ungureanu, S. Santos, R. Boaventura, C. Botelho, Arsenic and antimony in water and wastewater: Overview of removal techniques with special reference to latest advances in adsorption. *J. Environ. Manage.* **2015**, *151*, 326–342.
2015WAN_WAN	L. Wang, C.-l. Wan, Y. Zhang, D.-J. Lee, X. Liu, X-f. Chen, J.-H. Tay, Mechanism of enhanced Sb(V) removal from aqueous solution using chemically modified aerobic granules. *J. Hazard. Mater.* **2015**, *284*, 43–49.
2015WAN_ZHA	Y. Wang, D. Zhang, Z.-y. Shen, C.-h. Feng, X. Zhang, Investigation of the interaction between As and Sb species and dissolved organic matter in the Yangtze Estuary, China, using excitation–emission matrices with parallel factor analysis. *Environ. Sci. Pollut. Res.* **2015**, *22*, 1819–1830.
2015YAN_HE	H. Yang, M. He, X. Wang, Concentration and speciation of antimony and arsenic in soil profiles around the world's largest antimony metallurgical area in China. *Environ. Geochem. Health* **2015**, *37*, 21–33.
2014ANS_KLA	L. Ansone, M. Klavins, M. Jankevica, A.Viksna, Biomass sorbents for metalloid removal. *Adsorption* **2014**, *20*, 275–286.
2014DOR_AMA	P. Dorjee, D. Amarasiriwardena, B. Xing, Antimony adsorption by zero-valent iron nanoparticles (nZVI): Ion chromatography–inductively coupled plasma mass spectrometry (IC–ICP-MS) study. *Microchem. J.* **2014**, *116*, 15–23.

2014FAN_TAN H.-T. Fan, Q. Tang, Y. Sun, Z.-G. Zhang, W.-X. Li, Selective removal of antimony(III) from aqueous solution using antimony(III)-imprinted organic–inorganic hybrid sorbents by combination of surface imprinting technique with sol–gel process. *Chem. Eng. J.* **2014**, *258*, 146–156.

2014FER_DOS S. L. C. Ferreira, W.N.L. dos Santos, I. F. dos Santos, M. M. S. Junior, L. O. B. Silva, U. A. Barbosa, F. A. de Santana, A. F. de S. Queiroz, Strategies of sample preparation for speciation analysis of inorganic antimony using hydride generation atomic spectrometry. *Microchem. J.* **2014**, *114*, 22–31.

2014GUI_CAL F. Guillamot, V. Calvert, M.-V. Millot, S. Criquet, Does antimony affect microbial respiration in Mediterranean soils? A microcosm experiment. *Pedobiologia* **2014**, *57*, 119–121.

2014GUO_WU X. Guo, Z. Wu, M. He, X. Meng, X. Jin, N. Qiu, J. Zhang, Adsorption of antimony onto iron oxyhydroxides: Adsorption behavior and surface structure. *J. Hazard. Mater.* **2014**, *276*, 339−345.

2014JAB_SZO M. Jabłońska-Czapla, S .Szopa, K. Grygoyć, A. Łyko, R. Michalski, Development and validation of HPLC–ICP-MS method for the determination inorganic Cr,As and Sb speciation forms and its application for Pławniowice reservoir (Poland) water and bottom sediments variability study. *Talanta* **2014**, *120*, 475–483.

2014KUL_MIL T. R. Kulp, L. G. Miller, F. Braiotta, S. M. Webb, B. D. Kocar, J. S. Blum, R. S. Oremland, Microbiological reduction of Sb(V) in anoxic freshwater sediments. *Environ. Sci. Technol.* **2013**, *48*, 218−226.

2014NAK_ALT Y. M. Nakamaru, J. Altansuvd, Speciation and bioavailability of selenium and antimony in non-flooded and wetland soils: A review. *Chemosphere* **2014**, *111*, 366–371.

2014SHA_MA C. Shan, Z. Ma, M. Tong, Efficient removal of trace antimony(III) through adsorption by hematite modified magnetic nanoparticles. *J. Hazard. Mater.* **2014**, *268*, 229–236.

2014TIS_LES R. Tisarum, J. T. Lessl, X. Dong, L. M. de Oliveira, B. Rathinasabapathi, L. Q. Ma, Antimony uptake, efflux and speciation in arsenic hyperaccumulator *Pteris vittata*. *Environ. Poll.* **2014**, *186*, 110–114.

2013AME_MEI S. Amereih, T. Meisel, Z. Barghouthi, W. Wegscheider, Determination of inorganic antimony species conversions during its speciation analysis in soil using isotope dilution techniques. *J. Anal. Sci. Meth. Instrum.* **2013**, *3*, 130–136.

2013COS_ROM I. Costas-Mora, V. Romero, I. Lavilla, C. Bendicho, Solid-state chemiluminescence assay for ultrasensitive detection of antimony using on-vial immobilization of CdSe quantum dots combined with liquid–liquid–liquid microextraction. *Anal. Chim. Acta* **2013**, *788*, 114– 21.

2013FAN_WAN J.-X. Fan, Y.-J. Wang, X.-D. Cui, D.-M. Zhou, Sorption isotherms and kinetics of Sb(V) on several Chinese soils with different physicochemical properties. *J. Soils Sediments* **2013**, *13*, 344–353.

2013IQB_SAE M. Iqbal, A. Saeed, R. G. J. Edyvean, Bioremoval of antimony(III) from contaminated water using several plant wastes: Optimization of batch and dynamic flow conditions for sorption by green bean husk (*Vigna radiata*). *Chem. Eng. J.* **2013**, *225*, 192–201.

2013MEN_BAR D. Mendil, H. Bardak, M.Tuzen, M. Soylak, Selective speciation of inorganic antimony on tetraethylenepentamine bonded silica gel column and its determination by graphite furnace atomic absorption spectrometry. *Talanta* **2013**, *107*, 162–166.

2013PAO_FIO L. Paoli, E. Fiorini, S. Munzi, S. Sorbo, A. Basile, S. Loppi, Antimony toxicity in the lichen *Xanthoria parietina* (L.) Th. Fr. *Chemosphere* **2013**, *93*, 2269–2275.

2013ROJ_ARA C.Rojas, V. Arancibia, M. Gómez, E. Nagles, High sensitivity adsorptive stripping voltammetric method for antimony(III) determination in the presence of quercetin-5'-sulfonic acid. Substituent effect on sensitivity. *Sensors Actuat. B* **2013**, *185*, 560–567.

2013SAL_MOH M. A. Salam, R. M. Mohamed. Removal of antimony(III) by multi-walled carbon nanotubes from model solution and environmental samples. *Chem. Eng. Res. Des.* **2013**, *91*, 1352–1360.

2013SON_ZHA W. Song, D. Zhang, X. Pan, D.-J. Lee, Complexation of HAS with different forms of antimony (Sb): An application of fluorescence spectroscopy. *J. Lumin.* **2013**, *136*, 80–85.

2013WEN_ZHU S. Wen, X. Zhu, Speciation of antimony(III) and antimony(V) by electrothermal atomic Absorption spectrometry after ultrasound-assisted emulsification of solidified floating organic drop microextraction. *Talanta* **2013**, *115*, 814–818.

2013XI_HE J. Xi, M. He, P. Wang, Adsorption of antimony on sediments from typical water systems in China: A comparison of Sb(III) and Sb(V) pattern. *Soil Sediment. Contam.* **2014**, *23*, 37–48.

2012ANJ_DAT A. Anjum, M. Datta, Adsorptive removal of antimony (III) using modified montmorillonite: A study on sorption kinetics. *J. Anal. Sci. Meth. Instrum.* **2012**, *2*, 167–175.

2012GE_WEI Z. Ge, C. Wei, Simultaneous analysis of Sb^{III}, Sb^{V} and TMSb by High Performance Liquid Chromatography–Inductively Coupled Plasma–Mass Spectrometry detection: Application to antimony speciation in soil samples. *J. Chromatogr. Sci.* **2012**, *00*,1–9.

2012LEN_GUO Y. Leng, W. Guo, S. Su, C. Yi, L. Xing, Removal of antimony(III) from aqueous solution by graphene as an adsorbent. *Chem. Eng. J.* **2012**, *211–212*, 406–411.

2012TSE_LIU Tserenpil. Sh, C.-Q. Liu, L. Wang, Antimony coordination to humic acid: Nuclear magnetic resonance and X-ray absorption fine structure spectroscopy study. *Microchem. J.* **2012**, *103*, 68–73.

2012WU_SUN F. Wu, F. Sun, S. Wu, Y. Yan, B. Xing, Removal of antimony(III) from aqueous solution by freshwater cyanobacteria *Microcystis* biomass. *Chem. Eng. J.* **2012**, *183*, 172–179.

2011AMA_WU D. Amarasiriwardena, F. Wu, Antimony: Emerging toxic contaminant in the environment. *Microchem. J.* **2011**, *97*, 1−3.

2011GAD_SAN N. S. Gadhari, B. J.Sanghavi, A. K. Srivastava, Potentiometric stripping analysis of antimony based on carbon paste electrode modified with hexathia crown ether and rice dusk. *Anal. Chim. Acta* **2011**, *703*, 31−40.

2011OKK_ZHU G. Okkenhaug, Y.-G. Zhu, L. Luo, M. Lei, X. Li, J. Mulder, Distribution, speciation and availability of antimony (Sb) in soils and terrestrial plants from an active Sb mining area. *Environ. Pollut.* **2011**, *159*, 2427–2434.

2011QUI_OLI W. Quiroz, D. Olivares, M. Bravo, J. Feldmann, A. Raab, Antimony speciation in soils: Improving the detection limits using post-column pre-reduction hydride generation atomic fluorescence spectroscopy (HPLC/pre-reduction/HG-AFS). *Talanta* **2011**, *84*, 593–598.

2011XU_WAN W. Xu, H. Wang, R. Liu, X.Zhao, J. Qu, The mechanism of Sb(III) removal and its reactions on the surfaces of Fe–Mn binary oxide. *J. Colloid Interface Sci.* **2011**, *363*, 320–326.

2011ZEN_YAN C. Zeng, F. Yang, N. Zhou, Hollow fiber supported liquid membrane extraction coupled with thermospray flame furnace atomic absorption spectrometry for the speciation of Sb(III) and Sb(V) in environmental and biological samples. *Microchem. J.* **2011**, *98*, 307–311.

2010DUA_SON L.-Q. Duan, J.-M. Song, X.-G. Li, H.-M. Yuan, The behaviors and sources of dissolved arsenic and antimony in Bohai Bay. *Cont. Shelf Res.* **2010**, *30*, 1522–1534.

2010FU_WU Z. Fu, F. Wu, D. Amarasiriwardena, C. Mo, B. Liu, J. Zhu, Q. Deng, H. Liao, Antimony, arsenic and mercury in the aquatic environment and fish in a large antimony mining area in Hunan, China. *Sci. Total Environ.* **2010**, *408*, 3403–3410.

2010JIA_WEN X. Jiang, S. Wen, G. Xiang, Cloud point extraction combined with electrothermal atomic absorption spectrometry for the speciation of antimony (III) and antimony(V) in food packaging materials. *J. Hazard. Mater.* **2010**, *175*, 146–150.

2010LIU_LE F. Liu, X. C. Le, A. McKnight-Whitford, Y. Xia, F. Wu, E. Elswick, C. C. Johnson, C. Zhu, Antimony speciation and contamination of waters in the Xikuangshan antimony mining and smelting area, China. *Environ. Geochem. Health* **2010**, *32*, 401–413.

2010POP_HAN M. Popp, S.Hann, G.Koellensperger, Environmental application of elemental speciation analysis based on liquid or gas chromatography hyphenated to inductively coupled plasma mass spectrometry-A review. *Anal. Chim. Acta* **2010**, *668*, 114–129.

2010SAR_CIT A. Sari, D. Çıtak, M. Tuzen Equilibrium, thermodynamic and kinetic studies on adsorption of Sb(III) from aqueous solution using low-cost natural diatomite. *Chem. Eng. J.* **2010**, *162*, 521–527.

2010ULU_SAR O. D. Uluozlu, A. Sarı, M. Tuzen, Biosorption of antimony from aqueous solution by lichen (*Physcia tribacia*) biomass. *Chem. Eng. J.* **2010**, *163*, 382–388.

2010WIL_LOC S. C. Wilson, P. V. Lockwood, P. M. Ashley, M.Tighe, The chemistry and behaviour of antimony in the soil environment with comparisons to arsenic: A critical review. *Environ. Pollut.* **2010**, *158*, 1169–1181.

2010WU_HE Z. Wu, M. He, X. Guo, R.g. Zhou, Removal of antimony (III) and antimony (V) from drinking water by ferric chloride coagulation: Competing ion effect and the mechanism analysis. *Sep. Purif. Technol.* **2010**, *76*, 184–190.

2010XI_HE J. Xi, M. He, C. Lin, Adsorption of antimony(V) on kaolinite as a function of pH, ionic strength and humic acid. *Environ. Earth Sci.* **2010**, *60*, 715–722.

2009ACK_GIE S. Ackermann, R. Gieré, M. Newville, J. Majzlan, Antimony sinks in the weathering crust of bullets from Swiss shooting ranges. *Sci. Total Environ.* **2009**, *407*, 1669–1682.

2009AN_KIM Y. J. An, M. Kim, Effect of antimony on the microbial growth and the activities of soil enzymes. *Chemosphere* **2009**, *74*, 654–659.

2009BEL_GOM A. Bellido-Martín, J. L. Gómez-Ariza, P. Smichowsky, D. Sánchez-Rodas, Speciation of antimony in airborne particulate matter using ultrasound probe fast extraction and analysis by HPLC-HG-AFS. *Anal. Chim. Acta* **2009**, *649*, 191–195.

2009CER_AMA G. Ceriotti, D. Amarasiriwardena, A study of antimony complexed to soil-derived humic acids and inorganic antimony species along a Massachusetts highway. *Microchem. J.* **2009**, *91*, 85–93.

2009FER_FER H. S. Ferreira, S. L. C. Ferreira, M. L. Cervera, M. de la Guardia, Development of a non-chromatographic method for the speciation analysis of inorganic antimony in mushroom samples by hydride generation atomic fluorescence spectrometry. *Spectrochim. Acta, Part B* **2009**, *64*, 597–600.

2009FIL_WIL M. Filella, P. A. Williams, N. Belzile, Antimony in the environment: Knowns and unknowns. *Environ. Chem.* **2009**, *6*, 95−105.

2009GON_CER A. Gonzalvez, M. L. Cervera, S. Armenta, M. de la Guardia, A review of non-chromatographic methods for speciation analysis. *Anal. Chim. Acta* **2009**, *636*, 129–157.

2009GUO_WU X. Guo, Z. Wu, M. He, Removal of antimony(V) and antimony(III) from drinking water by coagulationflocculationsedimentation (CFS). *Water Res.* **2009**, *43*, 4327−4335.

2009MAD_BOZ T. Madrakian, E. Bozorgzadeh, Spectrophotometric determination of Sb(III) and Sb(V) in biological samples after micelle-mediated extraction. *J. Hazard. Mater.* **2009**, *170*, 809−813.

2009MIT_TAK S. Mitsunobu, Y. Takahashi, Y. Sakai, K. Inumaru, Interaction of synthetic sulfate green rust with antimony(V). *Environ. Sci. Technol.* **2009**, *43*, 318−323.

2009MUL_DAU K. Müller, B. Daus, J. Mattusch, H.-J. Stärk, R. Wennrich, Simultaneous determination of inorganic and organic antimony species by using anion exchange phases for HPLC–ICP-MS and their application to plant extracts of *Pteris vittata*. *Talanta* **2009**, *78*, 820–826.

2009NAM_YAN S.-H. Nam, C.-Y. Yang, Y.-J. An, Effects of antimony on aquatic organisms (Larva and embryo of *Oryzias latipes*, *Moina macrocopa*, *Simocephalus mixtus*, and *Pseudokirchneriella subcapitata*). *Chemosphere* **2009**, *75*, 889–893.

2009PEN_LAV F. Pena-Pereira, I. Lavilla, C. Bendicho, Headspace single-drop microextraction with in situ stibine generation for the determination of antimony (III) and total antimony by electrothermal-atomic absorption spectrometry. *Mikrochim. Acta* **2009**, *164*, 77–83.

2009TEL_MAH K. Telford, A. W. Maher, A F. Krikowa, S. Foster, M. J. Ellwood, P. M. Ashley, P. V. Lockwood, S. C. Wilson, Bioaccumulation of antimony and arsenic in a highly contaminated stream adjacent to the Hillgrove Mine, NSW, Australia. *Environ. Chem.* **2009**, *6*, 133–143.

2008MAR_ATT S. Marcellino, H. Attar, D. Lièvremont, M.-C. Lett, F. Barbier, F. Lagarde, Heat-treated *Saccharomyces cerevisiae* for antimony speciation and antimony(III) preconcentration in water samples. *Anal. Chim. Acta* **2008**, *629*, 73–83.

2009TSC_ROB M. Tschan, B. H. Robinson, R. Schulin, Antimony in the soil–plant system – a review. *Environ. Chem.* **2009**, *6*, 106–115.

2008MIT_TAK S. Mitsunobu, Y. Takahashi, Y. Sakai, Abiotic reduction of antimony(V) by green rust ($Fe_4(II)Fe_2(III)(OH)_{12}SO_4 \cdot 3H_2O$). *Chemosphere* **2008**, *70*, 942–947.

2008NAK_SEK Y. M. Nakamaru, K. Sekine, Sorption behavior of selenium and antimony in soils as a function of phosphate ion concentration. *J. Plant Nutr. Soil Sci.* **2008**, *54*, 332–341.

2008OOR_SMO K.Oorts, E. Smolders, F. Degryse, J. Buekers, G. Gascó, G. Cornelis, J. Mertens, Solubility and toxicity of antimony trioxide (Sb_2O_3) in soil. *Environ. Sci. Technol.* **2008**, *42*, 4378–4383.

2008SMI P. Smichowski, Antimony in the environment as a global pollutant: A review on analytical methodologies for its determination in atmospheric aerosols. *Talanta* **2008**, *75*, 2–14.

2008TIT_KEN S. Titretir, E. Kendüzler, Y Arslan, İ. Kula, S. Bakırdere, O. Y. Ataman, Determination of antimony by using tungsten trap atomic absorption spectrometry. *Spectrochim. Acta, Part B* **2008**, *63*, 875–879.

2008WES_PRA P. Westerhoff, P. Prapaipong, E. Shock, A. Hillaireau, Antimony leaching from polyethylene terephthalate (PET) plastic used for bottled drinking water. *Water Res.* **2008**, *42*, 551–556.

2008ZIH_JAN K. Zih-Perényi, P. Jankovics, É. Sugár, A. Lásztity, Solid phase chelating extraction and separation of inorganic antimony species in pharmaceutical and water samples for graphite furnace atomic absorption spectrometry. *Spectrochim. Acta, Part B* **2008**, *63*, 445–449.

2007ETT_MIH V. Ettler, M. Mihaljevič, O. Šebek, Z. Nechutný, Antimony availability in highly polluted soils and sediments – A comparison of single extractions. *Chemosphere* **2007**, *68*, 455–463.

2007FIL_BEL M. Filella, N. Belzile, M.-C. Lett, Antimony in the environment: A review focused on natural waters. III. Microbiota relevant interactions. *Earth Sci. Rev.* **2007**, *80*, 195–217.

2007HUA_HU C. Huang, B. Hu, Z. Jiang, Simultaneous speciation of inorganic arsenic and antimony in natural waters by dimercaptosuccinic acid modified mesoporous titanium dioxide micro-column on-line separation and inductively coupled plasma optical emission spectrometry determination. *Spectrochim. Acta, Part B* **2007**, *62*, 454–460.

2007KAB_MUK A. Kabata-Pendias, A.B. Mukherjee, *Trace Elements from Soil to Human* **2007**, p. 392 **(**Springer: Berlin).

2007LEH_KAS C. R. Lehr, D. R. Kashyap, T. R. McDermott, New insights into microbial oxidation of antimony and arsenic. *Appl. Environ. Microbiol.* **2007**, *73*, 2386−2389.

2007PAC_GIL P. H. Pacheco, R. A. Gil, L. D. Martinez, G. Polla, P. Smichowski, A fully automated system for inorganic antimony preconcentration and speciation in urine. *Anal. Chim. Acta* **2007**, *603*, 1−7.

2007WU_JIN H. Wu, Y. Jin, Y. Tian, X. Tao, S. Bi, Determination of antimony(III) and antimony(V) in natural waters at ultratrace levels by flow injection on-line sorption preconcentration coupled with hydride generation atomic fluorescence spectrometry. *At. Spectrosc.* **2007**, *28*, 220–226.

2007YER_ERD M. Yersel, A. Erdem, A. E. Eroğlu, T. Shahwan, Separation of trace antimony and arsenic prior to hydride generation atomic absorption spectrometric determination. *Anal. Chim. Acta* **2005**, *534*, 293–300.

2007ZHA_MOR L. Zhang, Y. Morita, A. Sakuragawa, A. Isozaki, Inorganic speciation of As(III, V), Se(IV, VI) and Sb(III, V) in natural water with GF-AAS using solid phase extraction technology. *Talanta* **2007**, *72*, 723–729.

2006GRU_HAN S. C. Grund, K. Hanusch, H. J. Breunig, H. U. Wolf, Antimony and antimony compounds, in *Ullmann's Encyclopedia of Industrial Chemistry* **2006**, pp. 1–34 (Wiley: Weinheim).

2006KEL_ALE A. Kelepertsis, D. Alexakis, K. Skordas, Arsenic, antimony and other toxic elements in the drinking water of Eastern Thessaly in Greece and its possible effects on human health. *Environ. Geol.* **2006**, *50*, 76–84.

2006LI_HU Y. Li, B. Hu, Z. Jiang, On-line cloud point extraction combined with electrothermal vaporization inductively coupled plasma atomic emission spectrometry for the speciation of inorganic antimony in environmental and biological samples. *Anal. Chim. Acta* **2006**, *576*, 207–214.

2006MIT_HAR S. Mitsunobu, T. Harada, Y.Takahashi, Comparison of antimony behavior with that of arsenic under various soil redox conditions. *Environ. Sci. Technol.* **2006**, *40*, 7270–7276.

2006ROD_TYS Y. Rodriguez, J. F. Tyson, Determination of antimony by atomic absorption spectrometry with flow injection hydride generation by a tetrahydroborate-form anion-exchanger. *J. Anal. At. Spectrom.* **2006**, *21*, 757–762.

2006SCH_ROS A. C. Scheinost, A. Rossberg, D. Vantelon, I. Xifra, R. Kretzschmar, A.-K. Leuz, H. Funke C. A. Johnson, Quantitative antimony speciation in shooting-range soils by EXAFS spectroscopy. *Geochim. Cosmochim. Acta* **2006**, *70*, 3299–3312.

2006VIN_LOP P. Viñas, I. López-Garcia, B. Merino-Meroño, M. Hernández-Córdoba, Liquid chromatography-hydride generation-atomic fluorescence spectrometry hybridation for antimony speciation in environmental samples. *Talanta* **2006**, *68*, 1401–1405.

2005ABB_BAR A. Abbaspour, L. Baramakeh, Simultaneous determination of antimony and bismuth by beta-correction spectrophotometry and an artificial neural network algorithm. *Talanta* **2005**, *65*, 692–699.

2005AME_MEI S. Amereih, T. Meisel, E. Kahr, W. Wegscheider, Speciation analysis of inorganic antimony in soil using HPLC-ID-ICP-MS. *Anal. Bioanal. Chem.* **2005**, *383*, 1052–1059.

2005BUS_CAN J. Buschmann, S. Canonica, L. Sigg, Photoinduced oxidation of antimony(III) in the presence of humic acid. *Environ. Sci. Technol.* **2005**, *39*, 5335–5341.

2005COR R. Cornelis, *Handbook of Elemental Speciation II Species in the Environment, Food, Medicine and Occupational Health* **2005** (JohnWiley: Chichester, UK), p 49.

2005GOM_DOM M. J. Gómez González, O. Domínguez Renedo, M. J. Arcos Martínez, Simultaneous determination of antimony(III) and antimony(V) by UV–vis spectroscopy and partial least squares method (PLS). *Talanta* **2005**, *68*, 67–71.

2005SHO_KRA W. Shotyk, M. Krachler, B. Chen, Anthropogenic impacts on the biogeochemistry and cycling of antimony, in *Biogeochemistry, Availability and Transport of Metals in the Environment*. Metal Ions in Biological Systems, Vol. 44 (Eds A. Sigel, H. Sigel, R. K. O. Sigel) **2005**, pp. 177–203 (Marcel Dekker: New York).

2005TIG_ASH M. Tighe, P. Ashley, P. Lockwood, S. Wilson, Soil, water, and pasture enrichment of antimony and arsenic within a coastal floodplain system. *Sci. Total Environ.* **2005**, *347*, 175–186.

2005TIG_LOC M. Tighe, P. Lockwood, S. Wilson, Adsorption of antimony(V) by floodplain soils, amorphous iron(III) hydroxide and humic acid. *J. Environ. Monit.* **2005**, *7*, 1177–1185.

2005YER_ERD M. Yersel, A. Erdem, A. E. Eroğlu, T. Shahwan, Separation of trace antimony and arsenic prior to hydride generation atomic absorption spectrometric determination. *Anal. Chim. Acta* **2005**, *534*, 293–300.

2004BUS_SIG J. Buschmann, L. Sigg, Antimony(III) binding to humic substances: influence of pH and type of humic acid. *Environ. Sci. Technol.* **2004**, *38*, 4535–4541.

2004CRA_WIL D. Craw, N. Wilson, P. M. Ashley, Geochemical controls on the environmental mobility of Sb and As at mesothermal antimony and gold deposits. *Applied Earth Science (Trans. Inst. Min. Metall. B)* **2004**, *113*, B3–B10.

2004FRA_KUE K. A. Francesconi, D. Kuehnelt, Determination of arsenic species: A critical review of methods and applications, 2000-2003. *Analyst* **2004**, *129*, 373–395.

2004MIR_LOPa R. Miravet, J. F. López-Sánchez, R. Rubio, New considerations about the separation and quantification of antimony species by ion chromatography-hydride generation atomic fluorescence spectrometry. *J. Chromatogr. A* **2004**, *1052*, 121–129.

2004MIR_LOPb R. Miravet, J. F. López-Sánchez, R. Rubio, Comparison of pre-reducing agents for antimony determination by hydride generation atomic fluorescence spectrometry. *Anal. Chim. Acta* **2004**, *511*, 295–302.

2004OZD_SOY N. Ozdemir, M. Soylak, L. Elci, M. Dogan, Speciation analysis of inorganic Sb(III) and Sb(V) ions using mini column filled with Amberlite XAD-8 resin. *Anal. Chim. Acta* **2004**, *505*, 37–41.

2004SUN_QIA H.-w. Sun, F.-x. Qiao, R. Suo, L.-x. Li, S.-x. Liang, Simultaneous determination of trace arsenic(III), antimony(III), total arsenic and antimony in Chinese medicinal herbs by hydride generation double channel atomic fluorescence spectrometry. *Anal. Chim. Acta* **2004**, *505*, 255–261.

2004WIL_CRA N. J. Wilson, D. Craw, K. Hunter, Antimony distribution and environmental mobility at an historic antimony smelter site, New Zealand. *Environ. Pollut.* **2004**, *129*, 257–266.

2003ABB_NAJ A. Abbaspour, M. Najafi, Simultaneous determination of Sb(III) and Sb(V) by partial least squares regression. *Talanta* **2003**, *60*, 1079–1084.

2003ASH_CRA P. M. Ashley, D. Craw, B. P. Graham, D. A. Chappell, Environmental mobility of antimony around mesothermal stibnite deposits, New South Wales, Australia and southern New Zealand. *J. Geochem. Explor.* **2003**, *77*, 1–14.

2003BOE_KIR M. De Boeck, M. Micheline Kirsch-Volders, D. Lison, Cobalt and antimony: genotoxicity and carcinogenicity. *Mutat. Res.* **2003**, *533*, 135–152.

2003FUE_PINa E. Fuentes, H. Pinochet, I. De Gregori, M. Potin-Gautier, Redox speciation analysis of antimony in soil extracts by hydride generation atomic fluorescence spectrometry. *Spectrochim. Acta B* **2003**, *58*, 1279–1289.

2003FUE_PINb E. Fuentes, H. Pinochet, M. Potin-Gautier, I. De Gregori, Fractionation and redox speciation of antimony in agricultural soils by hydride generation atomic fluorescence spectrometry and stability of Sb(III) and Sb(V) during extraction with different extractant solutions. *J. AOAC Intern.* **2004**, *87*, 60–67.

2003GRE_FUE I. De Gregori, I. E. Fuentes, E. M. Rojas, M. H. Pinochet, H. M. Potin-Gautier, Monitoring of copper, arsenic and antimony levels in agricultural soils impacted and non-impacted by mining activities, from three regions in Chile. *J. Environ. Monit.* **2003**, *5*, 287–295.

2003PIC_BOS C. Picard, M. Bosco, Soil antimony pollution and plant growth stage affect the biodiversity of auxin-producing bacteria isolated from the rhizosphere of *Achillea ageratum* L. *FEMS Microbial. Ecol.* **2003**, *46*, 73–80.

2003SAR_SOY S. Saracoglu, M. Soylak, M. Dogan, L. Elci, Speciation of antimony using Chromosorb 102 resin as a retention medium. *Anal. Sci.* **2003**, *19*, 259–264.

2003WAG_PER S. E. Wagner, F. J. Peryea, R. A. Filby, Antimony impurity in lead arsenate insecticide enhances the antimony content of old orchard soils. *J. Environ. Qual.* **2003**, *32*, 736–738.

2002FIL_BELa M. Filella, N. Belzile, Y.-W. Chen, Antimony in the environment: a review focused on natural waters I. Occurrence. *Earth Sci. Rev.* **2002**, *57*, 125–176.

2002FIL_BELb M. Filella, N. Belzile, Y.-W. Chen, Antimony in the environment: a review focused on natural waters II. Relevant solution chemistry. *Earth Sci. Rev.* **2002**, *59*, 265-285.

2002FLO_SAN E. Marlon de Moraes Flores, E. Pereira dos Santos, J. Smanioto Barin, R. Zanella, V. Luiz Dressler, C. Figueiredo Bittencourt, Determination of antimony(III) and total antimony by hydride generation atomic absorption spectrometry in samples of injectable drugs used for leishmaniasis treatment. *J. Anal. At. Spectrom.* **2002**, *17*, 819–823.

2002SAY_BEL A. Sayago, R. Beltrán, M. A. F. Recamales, J. L. Gómez-Ariza, Optimization of an HPLC-HG-AFS method for screening Sb(V), Sb(III) and M_3SbBr_2 in water samples. *J. Anal. At. Spectrom.* **2002**, *17*, 1400–1404.

2002YU_CAI C. Yu, Q. Cai, Z.-X. Guo, Z. Yang, S.B. Khoo, Antimony speciation by inductively coupled plasma mass spectrometry using solid phase extraction cartridges. *Analyst* **2002**, *127*, 1380–1385.

2001ADR D. C. Adriano, *Trace Elements in Terrestrial Environments. Biogeochemistry, Bioavailability, and Risks of Metals. Second edition*. Chapter 19. **2001**, pp. 759–761 (Springer: New York).

2001BEL_CHE N. Belzile, Y.-W. Chen and Z. Wang, Oxidation of antimony (III) by amorphous iron and manganese oxyhydroxides. *Chem. Geol.* 174, 379–387 (2001).

2001DAS_GUA A. K. Das, M. de la Guardia, M.L. Cervera, Literature survey of on-line elemental speciation in aqueous solutions. *Talanta* 55, 1–28 (2001).

2001GRE_PIN I. De Gregori, H. Pinochet, E. Fuentes, M. Potin-Gautier, Determination of antimony in soils and vegetables by hydride generation atomic fluorescence spectrometry and electrothermal atomic absorption spectrometry. Optimization and comparison of both analytical techniques. *J. Anal. At. Spectrom.* **2001**, *16*, 172–178.

2001KRA_EMO M. Krachler, H. Emons and J. Zheng, Speciation of antimony for the 21st century: promises and pitfalls. *Trends Anal. Chem.* **2001**, *20*, 79–90.

2001KRA_SHO M. Krachler, W. Shotyk, H. Emons, Digestion procedures for the determination of antimony and arsenic in small amounts of peat samples by hydride generation atomic absorption spectrometry. *Anal. Chim. Acta* **2001**, *432*, 303–310.

2001PYR K. Pyrzynska, Analysis of selenium species by capillary electrophoresis. *Talanta* **2001**, *55*, 657–667.

2000CRA_FOR P. J. Craig, S. A. Foster, R. O. Jenkins, D. P. Miller, N. Ostah, L. M. Smith, T.-A. Morris, Occurrence, formation and fate of organoantimony compounds in marine and terrestrial environments. Chem. Processes Mar. Environ., 2nd Meeting, Date 1998, **2000**, pp. 265–280.

2000GAR_BUL S. Garboś, E. Bulska, A. Hulanicki, Z. Fijalek, K.Sołtyk, Determination of total antimony and antimony(V) by inductively coupled plasma mass spectrometry after selective separation of antimony(III) by solvent extraction with N-benzoyl-N-phenylhydroxylamine. *Spectrochim. Acta* **2000**, *B55*, 795–802.

2000KAN_KAW M. Kang, M. Kawasaki, S. Tamada, T. Kamei, Y. Magara, Effect of pH on the removal of arsenic and antimony using reverse osmosis membranes. *Desalination* **2000**, 131, 293–298.

2000LIN_PRA T. Lindemann, A. Prange, W. Dannecker, B. Neidhart, Stability studies of arsenic, selenium, antimony and tellurium species in water, urine, fish and soil extracts using HPLC-ICP-MS. *Fresenius J. Anal. Chem.* **2000**, *368*, 214.

2000NAS_MAS M. J. Nash, J. E. Maskall, S. J. Hill, Methodologies for determination of antimony in terrestrial environmental samples. *J. Environ. Monit.* **2000**, *2*, 97–109.

2000SAY_BEL A. Sayago, R. Beltrán, J. L. Gómez-Ariza, Hydride generation atomic fluorescence spectrometry (HG-AFS) as a sensitive detector for Sb(III) and Sb(V) speciation in water. *J. Anal. At. Spectrom.* **2000**, *15*, 423–428.

2000ZHE_OHA J. Zheng, M. Ohata, N. Furuta, Antimony speciation in environmental samples by using high-performance liquid chromatography coupled to inductively coupled plasma mass spectrometry. *Anal. Sci.* **2000**, *16*, 75–80.

1999BEL_CHE N. Belzile, Y.-W. Chen, Analytical procedure for the determination of antimony(III) and total antimony in amorphous iron and manganese oxyhydroxides. *Can. J. Anal. Sci. Spectrosc.* **1999**, *44*, 85–88.

1999GEB T. Gebel, Environmental medicine and toxicology of the metalloid antimony. *Umweltmed. Forsch. Praxis* **1999**, *4*, 259–267.

1999HE_YAN M. He, J. Yang, Effects of different forms of antimony on rice during the period of germination and growth and antimony concentration in rice tissue. *Sci. Total Environ.* **1999**, *243*, 149–155.

1999KAB_PEN A. Kabata-Pendias, H. Pendias, *Biogeochemistry of Trace Elements* **1999** (PWN: Warsaw).

1999LYN_CAP B. S. Lynch, C. C. Capen, E. R. Nestmann, G. Veenstra, J .A. Deyo, Review of subchronic/chronic toxicity of antimony potassium tartrate. *Regul. Toxicol. Pharm.* **1999**, *30*, 9–17.

1998CAI_SAL J. Cai, K. Salmon, M. S. DuBow, A chromosomal *ars* operon homologue of *Pseudomonas aeruginosa* confers increased resistance to arsenic and antimony in *Escherichia coli*. *Microbiology* **1998**, *144*, 2705–2713.

1998GEB_SUC T. W. Gebel, R. H. R. Suchenwirth, C. Bolten, H. H. Dunkelberg, Human biomonitoring of arsenic and antimony in case of an elevated geogenic exposure. *Environ. Health Persp.* **1998**, *106*, 33–39.

1998GUY_JON A. Guy, P. Jones, S. J. Hill, Identification and chromatographic separation of antimony species with α- hydroxy acids. *Analyst* **1998**, *123*, 1513–1518.

1998LIN_MIC J. Lintschinger, B. Michalke, S. Schulte-Hostede, P. Schramel, Studies on speciation of antimony in soil contaminated by industrial activity. *Int. J. Environ. Anal. Chem.* **1998**, *72*, 11–25.

1998POO_CHU R. Poon, I. Chu, P. Lecavalier, V. E. Valli, W. Foster, S. Gupta, B. Thomas, Effects of antimony on rats following 90-day exposure via drinking water. *Food Chem. Toxicol.* **1998**, *36*, 21–35.

1998SMI_MAD P. Smichowski, Y. Madrid, C. Cámara, Analytical methods for antimony speciation in waters at the ultratrace levels. A review. *Fresenius J. Anal. Chem.* **1998**, *360*, 623–629.

1998SUN_SIN S. Sundar, P. R. Sinha, N. K. Agrawal, R. Srivastava, P. M. Rainey, J. D. Berman, H. W. Murray, V. P. Singh, A cluster of cases of severe cardiotoxicity among kala-azar patients treated with a high-osmolarity lot of sodium antimony gluconate. *Am. J. Trop. Med. Hyg.* **1998**, *59*, 139–143.

1998ULR N. Ulrich, Speciation of antimony(III), antimony(V) and trimethylstiboxide by ion chromatography with inductively coupled plasma atomic emission spectrometric and mass spectrometric detection. *Anal. Chim. Acta* **1998**, *359*, 245–253.

1998ZHA_COR X. Zhang, R. Cornelis, L. Mees, Speciation of antimony(III) and antimony(V) species by using high-performance liquid chromatography coupled to hydride generation atomic spectrometry. *J. Anal. At. Spectrom.* **1998**, *13*, 205–207.

1997DEO_TAV N. V. Deorkar, L. L. Tavlarides, A chemically bonded adsorbent for separation of antimony, copper and lead. *Hydrometallurgy* **1997**, *46*, 121–135.

1997GEB T. Gebel, Arsenic and antimony: comparative approach on mechanistic toxicology. *Chem. Biol. Interact.* **1997**, *107*, 131–144.

1997MAE_FUK S. Maeda, H. Fukuyama, E. Yokoyama, T. Kuroiwa, A. Ohki, K. Naka, Bioaccumulation of antimony by *Chlorella vulgaria* and the association mode of antimony in the cell. *Appl. Organomet. Chem.* **1997**, *11*, 393–396.

1997WEY_RIC H. E. Wey, D. Richards, M. A. Tirmenstein, P. I. Mathias, M. Toraason, The role of intracellular calcium in antimony-induced toxicity in cultured cardiac myocytes. *Toxicol. Appl. Pharmacol.* **1997**, *145*, 202–210.

1996LEO_GER A. Leonard, G.B. Gerber, Mutagenicity, carcinogenicity and teratogenicity of antimony compounds. *Mut. Res.* **1996**, *366*, 1–8.

1996WAG_SAN W. Wagner, S. Sander, G. Henze, Trace analysis of antimony(III) and antimony (V) by adsorptive stripping voltammetry. *Fresenius Z. Anal. Chem.* **1996**, *354*, 11–15.

1996WHO WHO, *Guidelines for Drinking Water Quality: Health Criteria and Other Supporting Information, vol. 2* **1996**, pp. 147–156 (WHO: Geneva).

1995CAL_MAD M. B. de la Calle-Guntiñas, Y. Madrid, C. Cámara, Antimony speciation in water, in *Quality Assurance for Environmental Analysis* (Eds Quevauviller, Maier, Griepink) **1995**, pp. 263–283 (Elsevier).

1995CHW_ZMI J. Chwastowska, W. Zmijewska, E. Sterlinska. Determination of antimony(III, V) in natural waters by separation and preconcentration on a thionalide loaded resin followed by neutron activation analysis. *J. Radioanal. Nucl. Chem.* **1995**, *196*, 3–9.

1995DIE_REI C. Dietl, W. Reifenhäuser, L. Peichl, Association of antimony with traffic – occurrence in airborne dust, deposition and accumulation in standardized grass cultures. *Sci. Total Environ.* **1997**, *205*, 235–244.

1995KEN_LEI M. Kentner, M. Leinemann, K.-H. Schaller, D. Weltle, G. Lehnert, External and internal antimony exposure in starter battery production. *Int. Arch. Occup. Environ. Health* **1995**, *67*, 119–123.

1995SMI_MAD P. Smichowski, Y. Madrid, M. B. de la Calle-Gutiñas, C. Cámara, Separation and determination of antimony(III) and antimony(V) species by high-performance liquid chromatography with hydride generation atomic absorption spectrometric and inductively coupled plasma mass spectrometric detection. *J. Anal. At. Spectrom.* **1995**, *10*, 815–821.

1994GUR_SHA N. Gurnani, A. Sharma, G. Talukder, Effects of antimony on cellular systems in animals – a review. *Nucleus* **1994**, *37*, 71–96.

1994MAE S. Maeda, Safety and environmental effects, in *The Chemistry of Organic Arsenic, Antimony and Bismuth Compounds* (Eds S. Patai) **1994**, pp. 725–759 (Wiley: New York).

1994ZMI W. Zmijewska, Determination of antimony in natural waters by preconcentration on a chelating sorbent followed by instrumental Neutron Activation Analysis. *Biol. Trace Element Res.* **1994**, *43*, 251–257.

1993LAU_HOE R. R. Lauwerys, P. Hoet, Industrial Chemical Exposure Guidelines for Biological Monitoring, 2nd ed. Lewis Publishers, Boca Raton, FL, **1993**, pp 19–21.

1993SHA_PAT M. Sharma and K.S. Patel, Determination and speciation of antimony in waters. Intern. J. Anal. Chem. 50, 63–71 (1993).

1992CAL_MAD M. B. de la Calle-Guntiñas, Y. Madrid, C. Cámara, Stability study of total antimony, Sb(III) and Sb(V) at the trace level. *Fresenius J. Anal. Chem.* **1992**, *344*, 27–29.

1991CAL_MAD M. B. de la Calle Guntiñas, Y. Madrid, C. Cámara, Determination of total available antimony in marine sediments by slurry formation hydride generation atomic absorption spectrometry. Applicability to the selective determination of antimony (III) and antimony (V). *Analyst* **1991**, *116*, 1029–1032.

1991FOW_GOE B. A. Fowler, P. L. Goering, Antimony, in *Metals and their Compounds in the Environment. Occurrence, Analysis, and Biological Relevance* (Ed E. Merian) **1991**, pp. 743–750 (VCH: Weinheim).

1991MER E. Merian, *Metals and their Compounds in the Environment. Occurrence, Analysis, and Biological Relevance*, **1991** (VCH: Weinheim).

1989APT_HOW S. C. Apte, A. G. Howard, A.T. Campbell, Arsenic and antimony, in *Environmental Analysis using Chromatography interfaced with Atomic Spectroscopy* (Eds R. H. Harrison, S. Rapsomanikis) **1989**, pp. 258–298 (Ellis Horwood).

1990FER J. E. Fergusson, *The Heavy Elements. Chemistry, Environmental Impact and Health Effects* **1990** (Pergamon Press: Oxford).

1990THA_PIC P. Thanabalasingam, W.F. Pickering, Specific sorption of antimony(III) by the hydrous oxides of Mn, Fe, and Al. *Water Air Soil Pollut.* **1990**, *49*, 175–185.

1988IFF* (1988SEI_SIG) R. Iffland, Antimony, in *Handbook on Toxicity of Inorganic Compounds* (Eds H. G. Seiler, H. Sigel, A. Sigel) **1988**, pp. 67–76 (Marcel Dekker: New York).

1988NOR_MAR T. Norseth, I. Martinsen, Biological monitoring of antimony in *Biological Monitoring of Toxic Metals* (Eds T. W. Clarkson, L. Friberg, G. F. Nordberg, P.R. Sager) **1988**, pp. 337–367 (Plenum Publishing Corporation: New York).

1987MCA C.A. McAuliffe, Arsenic, antimony and bismuth, in *Comprehensive Coordination Chemistry. The Synthesis, Reactions, Properties and Applications of Coordination Compounds. Vol. 3 Main Group and Early Transition Elements* (Ed G. Wilkinson) **1987**, p. 238-298 (Pergamon: Oxford).

1987WIN K. A. Winship, Toxicity of antimony and its compounds. *Adv. Drug React. Ac. Pois. Rev.* **1987**, *2*, 67–90.

1986CRA P. J. Craig, Other organometallic compounds in the environment, in *Organometallic Compounds in the Environment. Principles and Reactions* (Ed P. J. Craig) **1986**, pp. 345–364 (Longman: Chichester).

1986ELI_FRI C. G Elinder, L. Friberg, Antimony, in *Handbook on the Toxicology of Metals, 2nd edition* (Ed L. Friberg, G. F. Nordberg, V. B. Vouk) **1986**, p. 26–42 (Elsevier, Amsterdam).

1984GAS_SMI R. E. Gasselin, R. P. Smith, H. C. Hodge, *Chemical Toxicology of Commercial Products* **1984** (Williams and Wilkins: London).

1984LEF_GER P. Leffler, L. Gerhardsson, D. Brune, G.F. Nordberg, Lung retention of antimony and arsenic in hamsters after the intratracheal instillation of industrial dust Scand. *J. Work Environ. Health* **1984**, *10*, 245–251.

1982GER_MAE G. B. Gerber, J. Maes, B. Eykens, Transfer of antimony and arsenic to the developing organism. *Arch. Toxicol.* **1982**, *49*, 159–168.

1980BER E. Berman, *Toxic Metals and their Analysis* **1980** (Heyden: London).

1979ELI_FRI D. G Elinder, L. Friberg, Antimony, in *Handbook on the Toxicology of Metals* (Eds L. Friberg, G. F. Nordberg, V. B. Vouk) **1979**, pp. 283–292 (Elsevier: Amsterdam).

1978VEN_LUC B. Venugopal, T. D. Luckey, *Metal Toxicity in Mammals. 2. Chemical Toxicity of Metals and Metalloids* **1978**, pp. 213–216 (Plenum Press: New York).

1977LUC_VEN T. D. Luckey, B. Venugopal, *Metal Toxicity in Mammals. 1 Physiologic and Chemical Basis for Metal Toxicity* **1977**, pp. 179 (Plenum Press: New York).

1977FOW_GOY	B. A. Fowler, R. A. Goyer, M. A. Mehlman, *Advances in Modern Toxicology. Vol. 2* **1977** (Wiley: New York).
1976STE	K. L. Stemmer, Pharmacology and toxicology of heavy metals: Antimony. *Pharmac. Ther. A* **1976**, *1*, 157–160.
1975LUC_VEN	T. D. Luckey, B. Venugopal, D. Hutcheson, *Heavy Metal Toxicity, Safety and Hormology* **1975**, pp. 42–43 (Georg Thieme Publishers: Stuttgart).
1941BRA_FRE	W. R. Bradley, W. G. Frederick, The toxicity of antimony - Animal studies. *Ind. Med.* **1941**, *2*, 15–22.
1927FLU	F. Flury, Zur Toxikologie des Antimons. *Arch. Exp. Pathol. Pharmakol.* **1927**, *126*, 87–103.