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SUPPLEMENTARY MATERIAL

Polypyridines, Picrates, Lanthanides: A Plethora of Stacks ?

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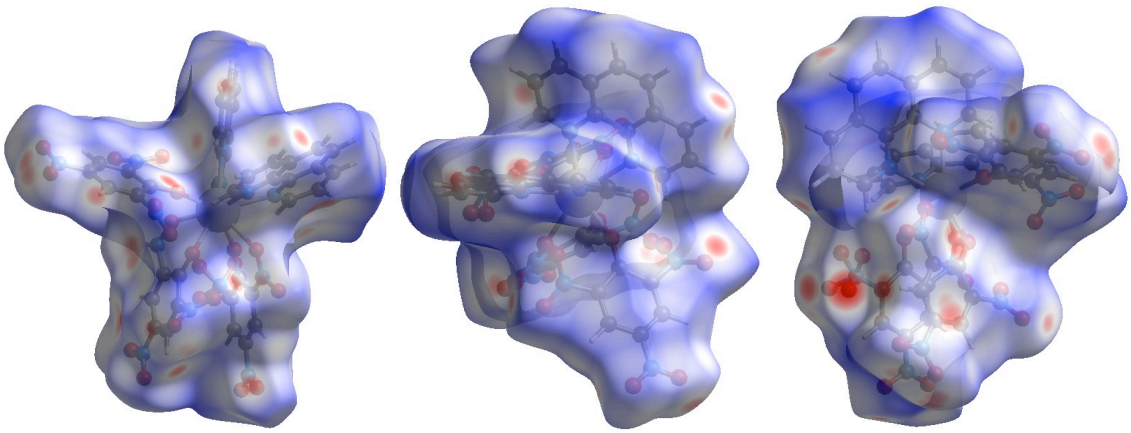
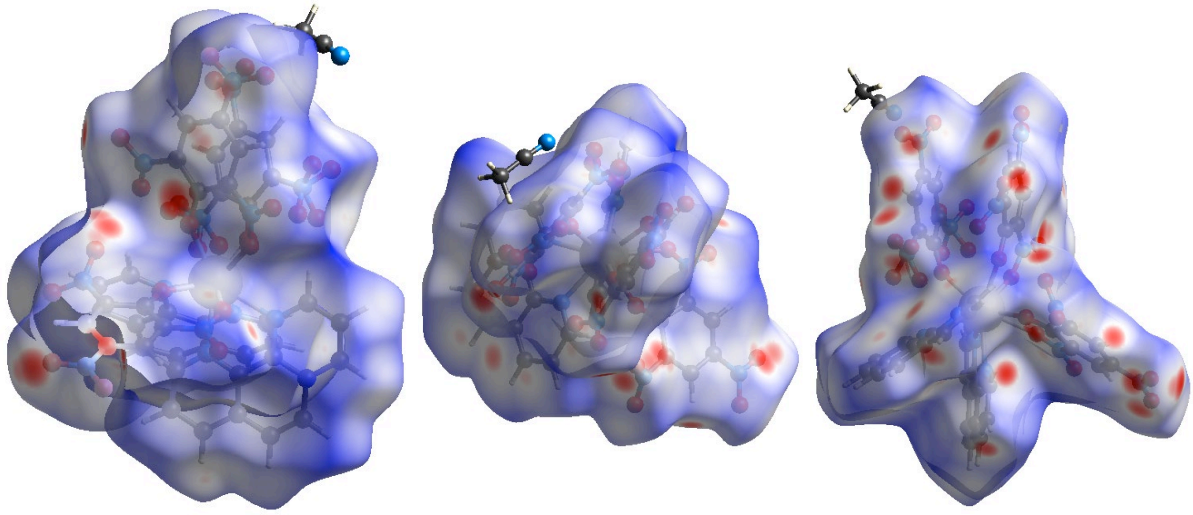


Down *a* Down *b* Down *c*

Figure S1 Views of the Hirshfeld surface calculated with CrystalExplorer for the molecule present in the lattice of [Eu(phen)$_2$(pic-O,O')$_2$(pic-O)]. d_{norm} representation, transparent mode; red regions indicate points where interactions with adjacent atoms of a separate molecule exceed dispersion.



Down *a* Down *b* Down *c*

Figure S2(a) Views of the Hirshfeld surface calculated with CrystalExplorer for the molecule present in the lattice of [Gd(phen)$_2$(pic-O,O')$_2$(pic-O)].CH$_3$CN. d_{norm} representation, transparent mode; red regions indicate points where interactions with adjacent atoms of a separate molecule exceed dispersion.

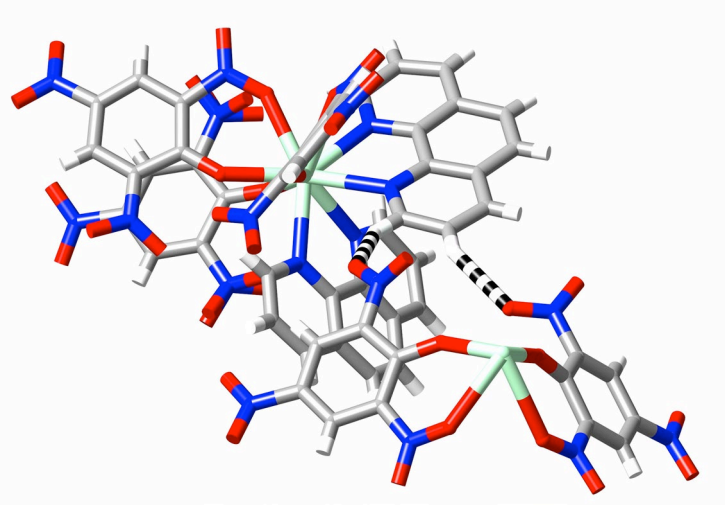


Figure S2(b) CH...O interactions (dashed lines) of phen1 in the molecule present in the lattice of [Gd(phen)$_2$(pic-O,O')$_2$(pic-O)].CH$_3$CN.

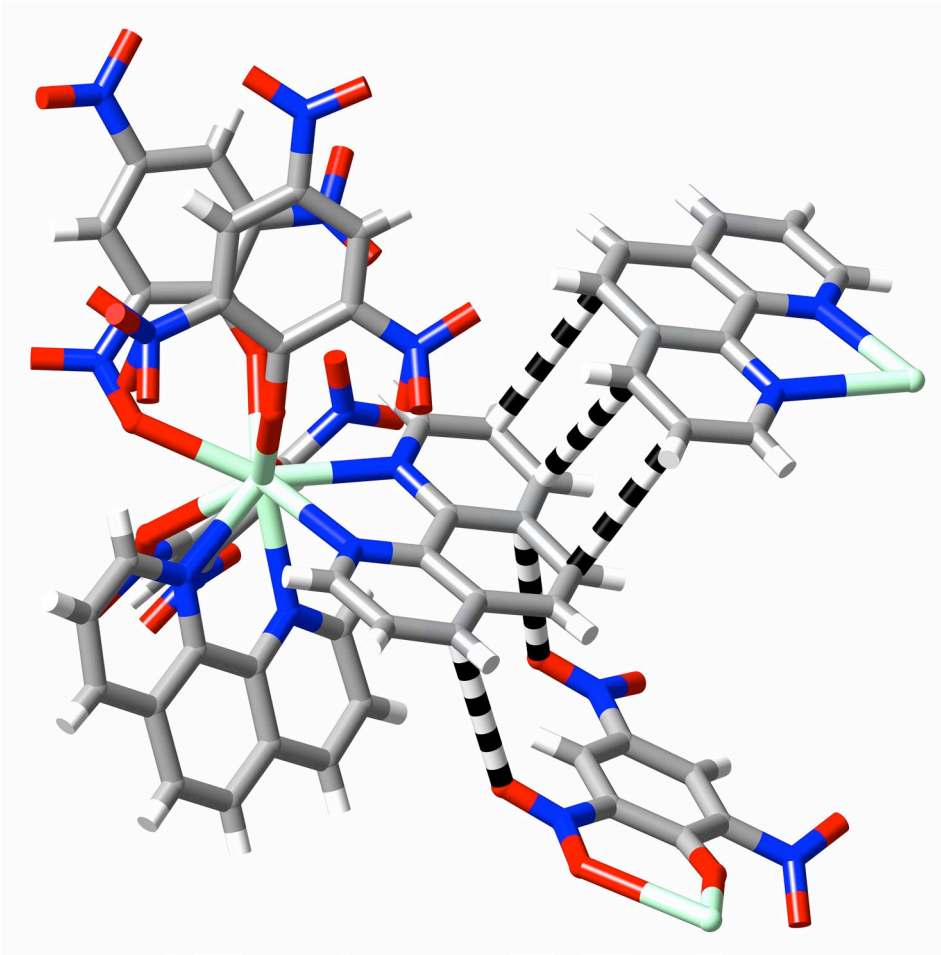


Figure S2(c) C...C interactions between phen2 ligands of adjacent molecules in the lattice of [Gd(phen)$_2$(pic-O,O')$_2$(pic-O)].CH$_3$CN. Additional C...O interactions are shown for one of the stacked pair. All interactions exceeding dispersion are shown as dashed lines.

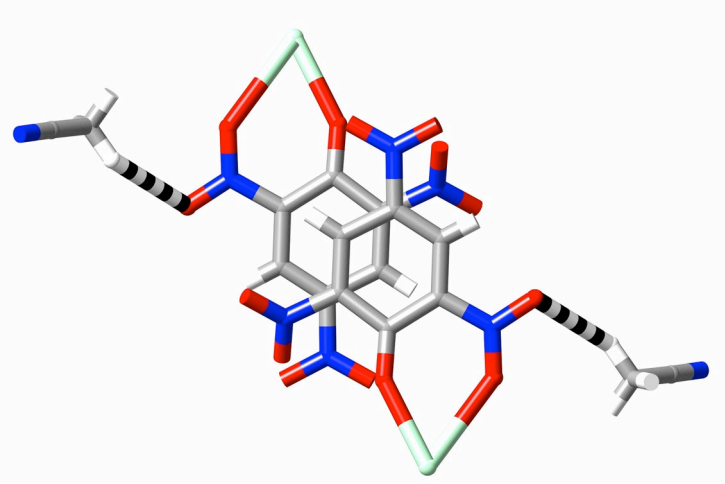


Figure S2(d) The stacked pair of picrate 1 units formed between two molecules in the lattice of [Gd(phen)$_2$(pic-O,O')$_2$(pic-O)].CH$_3$CN, projected perpendicular to the mean ring planes.. H-bonds to acetonitrile are shown as dashed lines.

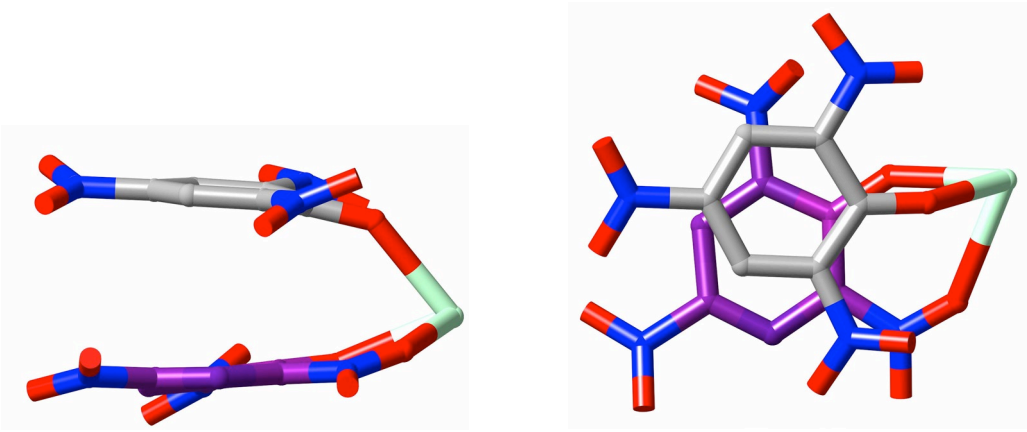


Figure S2(e) Orthogonal views of the intramoleculat stacking of picrates 2 and 3 within the coordination sphere of Gd^{III} in [Gd(phen)$_2$(pic-O,O')$_2$(pic-O)].CH$_3$CN. C atoms of picarte 3 are shown in violet.

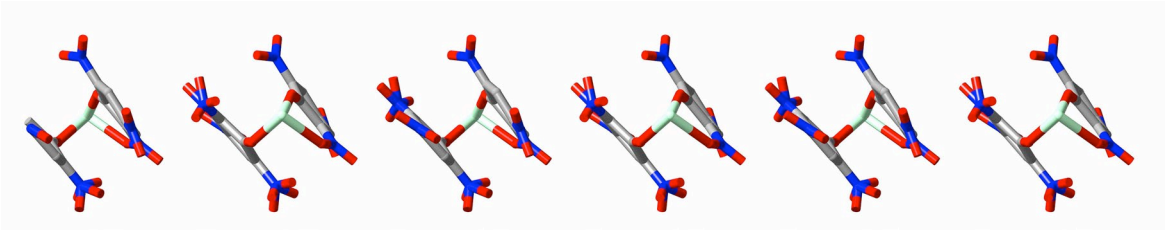
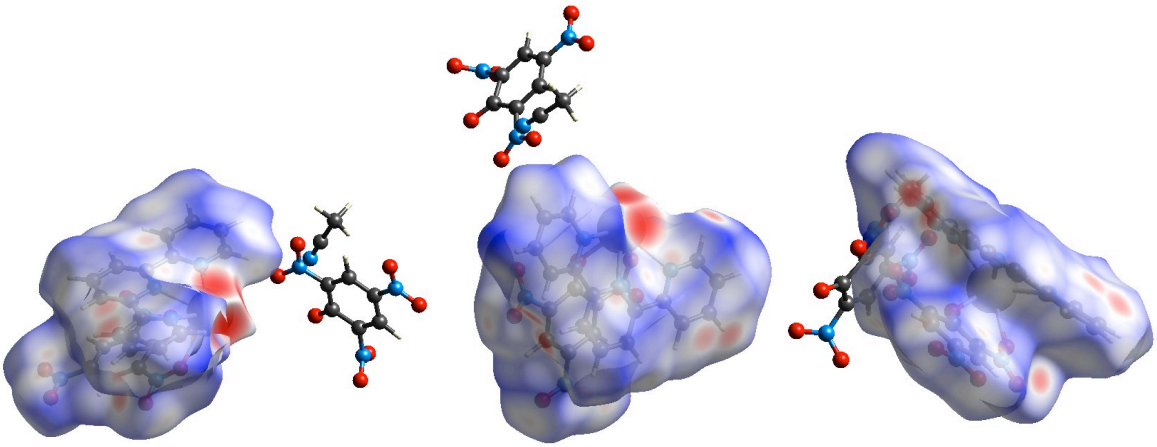


Figure S2(f) The slipped stack single column (running parallel to a) involving picrates 2 and 3 in both intra- and inter-molecular stacking. For clarity, the complete ligand environment of the Gd^{III} ions is not shown.



Down *a* Down *b* Down *c*

Figure S2(a) Views of the Hirshfeld surface calculated with CrystalExplorer for the asymmetric unit of the cation present in the lattice of [La(terpy)$_2$(pic)$_2$](pic).CH$_3$CN. d_{norm} representation, transparent mode; red regions indicate points where interactions with adjacent atoms of a separate molecule exceed dispersion.