

## New methods to capture insoluble, unstable titanium (IV) species in single-crystal form.

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The coordination of titanium (IV) halides to neutral L-type ligands and L-L type chelates results in fascinating geometries, brilliant colors unusual for a d<sup>0</sup> species, and unusual changes in Ti-X bond lengths. In spite of being a small, hard, highly Lewis-acidic metal center, Ti (IV) can surprisingly form eight-coordinate complexes with such ligands. However, TiX<sub>4</sub>(L)<sub>2</sub> or TiX<sub>4</sub>(L-L) species are typically unstable in solution when soluble, and more often than not, intractable solids that do not dissolve in common organic solvents. A methodology has been created for small-scale TiX<sub>4</sub>-ligand reactions that result in direct formation of high-quality single crystals. The method has been utilized in elucidating the structures of several insoluble titanium complexes that have evaded crystallographic characterization for generations.

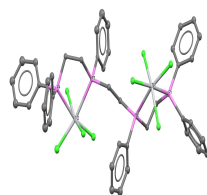


Figure 1