

UCo <sub>5</sub> Si <sub>3</sub>	<i>hP</i> 54	(176) <i>P</i> 6 <sub>3</sub> / <i>m</i> – h <sup>9</sup>
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**UCo<sub>5</sub>Si<sub>3</sub>** [1]

Structural features: Infinite columns of base-linked Si(U<sub>2</sub>Co<sub>4</sub>)Co<sub>2</sub> bicapped and Si(U<sub>2</sub>Co<sub>4</sub>)Co<sub>3</sub> tricapped trigonal prisms share atoms to form a 3D-framework with triple propeller-like columns and channels of hexagonal cross-section parallel to [001]. See Fig. IV.73.

Yarmolyuk Y.P. et al. (1978) [1]

Co<sub>5</sub>Si<sub>3</sub>U

*a* = 1.485, *c* = 0.3701 nm, *c/a* = 0.249, *V* = 0.7068 nm<sup>3</sup>, *Z* = 6

site	Wyck.	sym.	<i>x</i>	<i>y</i>	<i>z</i>	occ.	atomic environment
Co1	6 <i>h</i>	<i>m</i> ..	0.0481	0.2702	<sup>1</sup> / <sub>4</sub>		cuboctahedron Si <sub>4</sub> Co <sub>5</sub> U <sub>3</sub>
Si2	6 <i>h</i>	<i>m</i> ..	0.0482	0.4232	<sup>1</sup> / <sub>4</sub>		tricapped trigonal prism Co <sub>7</sub> U <sub>2</sub>
Co3	6 <i>h</i>	<i>m</i> ..	0.1106	0.1493	<sup>1</sup> / <sub>4</sub>		10-vertex polyhedron Co <sub>7</sub> Si <sub>3</sub>
Co4	6 <i>h</i>	<i>m</i> ..	0.2268	0.5727	<sup>1</sup> / <sub>4</sub>		11-vertex polyhedron Si <sub>5</sub> Co <sub>6</sub>
Si5	6 <i>h</i>	<i>m</i> ..	0.2631	0.1323	<sup>1</sup> / <sub>4</sub>		tricapped trigonal prism Co <sub>7</sub> U <sub>2</sub>
U6	6 <i>h</i>	<i>m</i> ..	0.2946	0.3946	<sup>1</sup> / <sub>4</sub>		23-vertex polyhedron Si <sub>9</sub> Co <sub>12</sub> U <sub>2</sub>
Co7	6 <i>h</i>	<i>m</i> ..	0.4195	0.2721	<sup>1</sup> / <sub>4</sub>		cuboctahedron Si <sub>4</sub> Co <sub>5</sub> U <sub>3</sub>
Co8	6 <i>h</i>	<i>m</i> ..	0.5427	0.0748	<sup>1</sup> / <sub>4</sub>		13-vertex polyhedron Si <sub>5</sub> Co <sub>5</sub> U <sub>3</sub>
Si9	6 <i>h</i>	<i>m</i> ..	0.5532	0.2435	<sup>1</sup> / <sub>4</sub>		bicapped square prism Co <sub>6</sub> Si <sub>2</sub> U <sub>2</sub>

Transformation from published data: origin shift 0 0 <sup>1</sup>/<sub>2</sub>

Experimental: single crystal, Weissenberg photographs, X-rays, R = 0.105

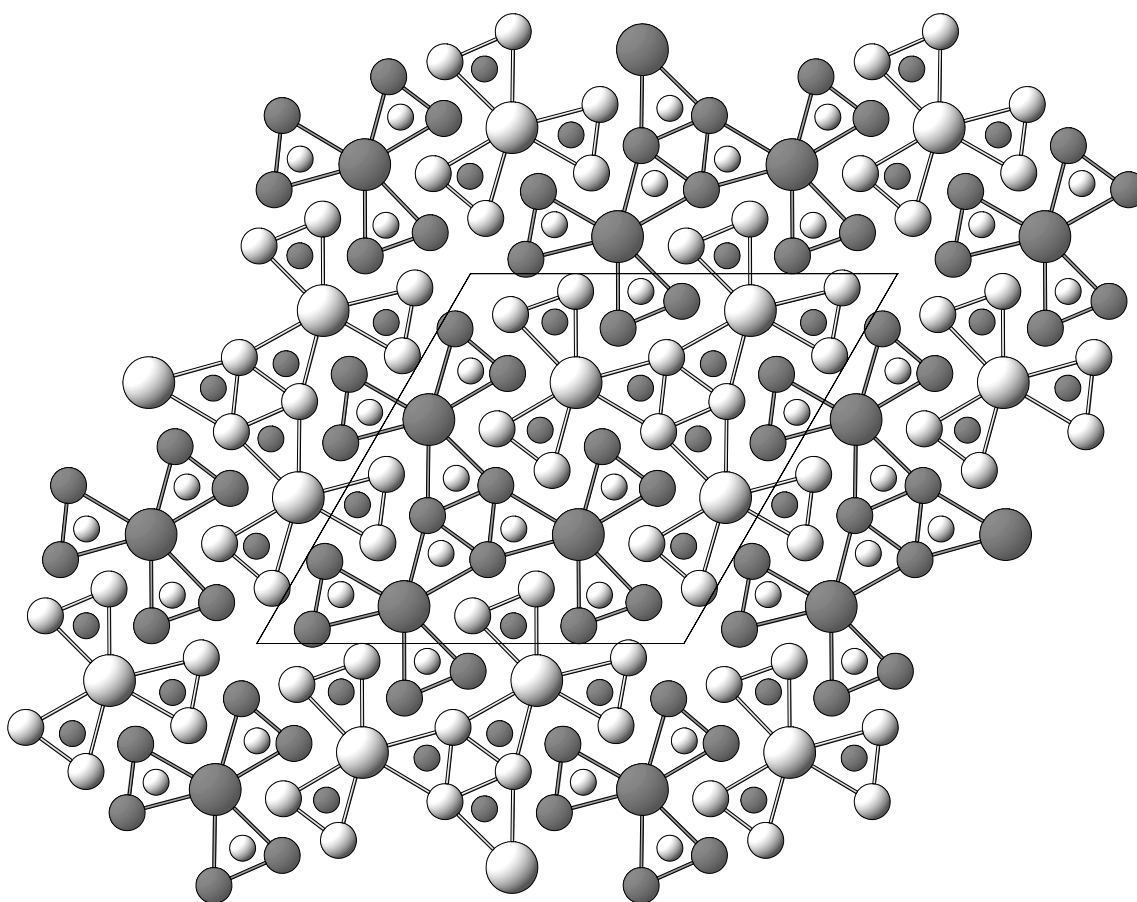


Fig. IV.73.  $\text{UCo}_5\text{Si}_3$

Arrangement of  $\text{Si}(\text{U}_2\text{Co}_4)$  trigonal prisms (Si atoms small, U atoms large, Co atoms medium) viewed along  $[001]$ . Light and dark atoms are shifted by  $c/2$ .

References: [1] Yarmolyuk Y.P., Aksel'rud L.G., Gladyshevskii E.I. (1978), Sov. Phys. Crystallogr. 23, 531-533 (Kristallografiya 23, 942-945).