

a more accurate lattice parameter. Cohen's least-squares method was applied to the hexagonal and tetragonal patterns.

3. Experimental data

The compounds and lattice parameters found in this investigation are listed in Tables 1 and 2. The observed and calculated intensities and d spacings for ThPd_3 of the hexagonal TiNi_3 -type are given in Table 3. Table 4 lists the observed and calculated d spacings and observed intensities for two compounds, VPd_3 and VPt_3 , of the TiAl_3 -type. No intensity calculations were made for VPd_3 and VPt_3 , but the observed intensities for these compounds are in good agreement with those published by Pearson & Hume-Rothery (1952) for the VNi_3 compound. The intensities observed by Pearson & Hume-Rothery for VNi_3 are reproduced in Table 4.

Table 5 lists similar data for the HfAl_3 compound, which is isostructural with ZrAl_3 . No intensity calculations were made for HfAl_3 , but the observed intensities for HfAl_3 are in good agreement with Brauer's data for ZrAl_3 , considering that the HfAl_3 intensities were obtained with $\text{Cr } K\alpha$ radiation, and the ZrAl_3 intensities with $\text{Cu } K\alpha$.

4. Discussion

With the discovery that ThPd_3 has the TiNi_3 structure, it is noted that the sequence of compounds TiPd_3 , ZrPd_3 , HfPd_3 , ThPd_3 and UPd_3 are isostructural. Likewise, the series TiRh_3 , ZrRh_3 , HfRh_3 , ThRh_3 and URh_3 all have

the Cu_3Au structure. The two compounds VPd_3 and VPt_3 are isostructural with VNi_3 . VPd_3 was previously reported by Koster & Haehl (1958).

The TiAl_3 family of compounds, of which VPd_3 and VPt_3 are members, has been indexed in the older literature with respect to two different unit cells. In this investigation we use the smaller unit cell proposed by Pearson & Hume-Rothery (1952) for VNi_3 . The c_0 parameters are the same for the two unit cells; the a_0 parameters are related by the factor $1/\sqrt{2}$.

The compound HfAl_3 is closely related to the TiAl_3 -type compounds, as was shown by Brauer (1934). The structure of HfAl_3 may be envisioned as containing two TiAl_3 unit cells stacked end to end with one inverted, and with certain layers rippled in the HfAl_3 structure as opposed to flat layers in the TiAl_3 structure.

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Structure cristalline du chloro 9-bromo 10-anthracène par diffraction des rayons X. Par M.

HOSPITAL, *Laboratoire de Minéralogie et de Rayons X, Faculté des Sciences, Université de Bordeaux, France*

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Le chloro 9-bromo 10-anthracène est isomorphe du dibromo 9-10 anthracène (Trotter, 1958). Les mailles tricliniques sont très semblables.

	Dibromo 9-10 anthracène (Trotter)	Chloro 9-bromo 10-anthracène
a	$8,88 \pm 0,02 \text{ \AA}$	$8,87 \pm 0,02 \text{ \AA}$
b	$16,15 \pm 0,04$	$16,14 \pm 0,03$
c	$4,06 \pm 0,01$	$4,06 \pm 0,01$
α	$97^\circ 05' \pm 10'$	$97^\circ 10' \pm 10'$
β	$100^\circ 21' \pm 10'$	$100^\circ 39' \pm 10'$
γ	$98^\circ 50' \pm 10'$	$98^\circ 27' \pm 10'$
v	$559,3 \text{ \AA}^3$	$558,2 \text{ \AA}^3$

Densité mesurée: $1,75 \text{ g.cm.}^{-3}$. Densité calculée: $1,735 \text{ g.cm.}^{-3}$.

Les noyaux anthracéniques occupent exactement les mêmes positions dans les 2 structures. Les molécules présentent un centre de symétrie comme dans le dibromo 9-10 anthracène.

La structure du chloro 9-bromo 10-anthracène est une

structure statistique analogue à celle du chloro 1-bromo 4-benzène (Klug, 1947). Les atomes lourds sont des atomes mixtes: $\frac{1}{2}(\text{Br} + \text{Cl})$.

La distance C_9 -atome lourd est de $1,88 \pm 0,01 \text{ \AA}$, intermédiaire entre $\text{C}_9\text{-Cl} = 1,74 \text{ \AA}$ dans le dichloro 9-10 anthracène (Trotter, 1959) et $\text{C}_9\text{-Br} = 1,93 \text{ \AA}$ du dibromo 9-10 anthracène (Trotter, 1958). Les atomes de carbone C_9 et C_{10} du noyau anthracénique sont cependant bien localisés et ne sont pas déplacés vers le chlore comme semble l'exiger la différence de $0,2 \text{ \AA}$ entre la liaison C-Br et la liaison C-Cl .

Les déformations du noyau anthracénique que l'on peut constater dans la structure du dibromo 9-10 anthracène (Trotter, 1958) se conservent intégralement dans la structure du chloro 9-bromo 10-anthracène.

Références

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