b) $CpU(NEt_2)_3$ reacts with $HPPh_2$ giving rise to an unstable intermediate (A) containing both $-NEt_2$ and $-PPh_2$ groups, which rearranges immediately to $Cp_2U(NEt_2)_2$.

By considering the hypothesis (a) the reaction mixture should contain $Cp_2U(NEt_2)_2$ and $U(NEt_2)_4$ in the presence of $HPPh_2$. As we reported, $Cp_2U(NEt_2)_2$ reacts with $HPPh_2$ to produce Cp_3UPPh_2 and in addition we observed that $U(NEt_2)_4$ and $HPPh_2$ (in molar ratio 1:1) quantitatively afford $U(NEt_2)_3(PPh_2)$ [9]; the lack of the Cp_3UPPh_2 and $U(NEt_2)_3(PPh_2)$ in the reaction mixture suggests that the hypothesis (a) has to be excluded while the (b) one seems to be acceptable.

On the other hand, the reaction of $U(NEt_2)_3(PPh_2)$ and cyclopentadiene in the molar ratio 1:1 produces the same reaction mixture as previously observed for the reactions between $CpU(NEt_2)_3$ and $HPPh_2$, making realistic the hypothesis (b) concerning the rearrangement of an unstable intermediate (A):

$$CpU(NEt_2)_3 + HPPh_2 \rightarrow U(NEt_2)_3(PPh_2) + CpH$$

$$\rightarrow CpU(NEt_2)_2(PPh_2) \quad (A)$$

$$\rightarrow Cp_2U(NEt_2)_2 + 'U(NEt_2)_2(PPh_2)'$$

Analogous studies on reactivity of the corresponding thorium amides are in progress.

1 M. F. Lappert, P. P. Power, A. R. Sanger and C. C. Srivastowa, 'Metals and metalloids amides: synthesis, structures, physical and chemical properties', Ellis Horwood, Chichester and J. Wiley, New York, 1980.
2 D. C. Bradley, *Adv. Inorg. Chem. Radiochem.*, *15*, 259 (1972);
D. C. Bradley and M. H. Chisholm, *Acc. Chem. Res.*, *2*, 273 (1976).
3 A. L. Arduini, N. M. Edelstein, J. D. Jamerson, J. G. Reynolds, K. Schmid and J. Takats, *Inorg. Chem.*, *20*, 2470 (1981).
4 A. L. Arduini and J. Takats, *Inorg. Chem.*, *20*, 2480 (1981).
5 A. L. Arduini, J. D. Jamerson and J. Takats, *Inorg. Chem.*, *20*, 2474 (1981).
6 G. Paolucci, P. Zanella, G. Rossetto and R. D. Fischer, Abstracts of the 13èmes Journées des Actinides, Eilat, Israel, 1983.
7 P. Zanella, G. Rossetto, G. Paolucci and A. Berton, *Atti IV Congresso Nazionale sull'attività di ricerca nei settori della Radiochimica, della Chimica Nucleare, delle Radiazioni e dei Radioelementi*, Padova, 1982.
8 P. Zanella, G. Rossetto and G. Paolucci, *Inorg. Chim. Acta*, in press.
9 G. Paolucci, P. Zanella, G. Rossetto and R. D. Fischer, *J. Organomet. Chem.*, submitted.
10 G. Paolucci, P. Zanella and G. Rossetto, *manuscript in preparation.*
11 G. Paolucci, P. Zanella and G. Rossetto, *manuscript in preparation.*
12 G. Rossetto, G. Paolucci, P. Zanella and R. D. Fischer, *Proceeding of the second JUPAC symposium on organometallic Chemistry*, Dijon, August 1983.
13 R. E. Cramer, R. B. Maynard, J. C. Daw and J. W. Gilje, *Organometallics*, *1*, 869 (1982).
14 K. W. Bagnall, M. J. Plews, D. Brown, R. D. Fischer, E. Klahne, G. W. Landgrat and G. R. Sienel, *J. Chem. Soc. Dalton*, 1999 (1982).

A26

Preparation and Properties of Hydrated Uranium Trichlorides

JANUSZ DROŻDŻYŃSKI

Institute of Chemistry, University of Wrocław, Wrocław, Poland

The preparation of the hydrated uranium trichlorides: $UCl_3 \cdot 7H_2O$, $UCl_3 \cdot 4H_2O$, $UCl_3 \cdot 3H_2O$ and $UCl_3 \cdot 2H_2O$ as well as some of their structural, spectroscopic and magnetic properties are reported.

The compounds were prepared by means of a general method presented in Ref. 1. The navy blue heptahydrate and the purple tetrahydrate could be directly obtained from solutions, whereas the remaining hydrates have been obtained by a controlled vacuum thermal dehydration. The compounds are relatively stable towards oxygen but are readily oxidized in presence of moisture. Vacuum dehydration at 600–700 K gives the anhydrous chloride. The composition of the hydrates has also been confirmed by a thermogravimetric analysis.

The solution and solid state spectra of the compounds are discussed. The heptahydrate exhibits an absorption spectrum almost identical with that of the aqueous ion. The less hydrated compounds show an intense absorption at about 18000 cm^{-1} which is characteristic for uranium(III) complex chlorides.

Magnetic susceptibilities of polycrystalline samples were measured by the Faraday method in the 6.5–295 K range. The uranium trichloride heptahydrate follows in this region the Curie–Weiss law with $C = 1.0839$ emu K mol^{-1} and $\theta = -32.72$ K.

1 J. Drożdżyński, *Inorg. Chim. Acta*, *32*, L83 (1979).