

Alkoxometalates

A possible synthesis route to homonuclear aluminium sesquialkoxides is the reaction of equimolar amounts of aluminium with an alcohol in xylene under reflux conditions [eqn. (1)]. $\text{Al}(\text{O}^c\text{Hex})_3$ is trimeric in the solid state (fig. 1)

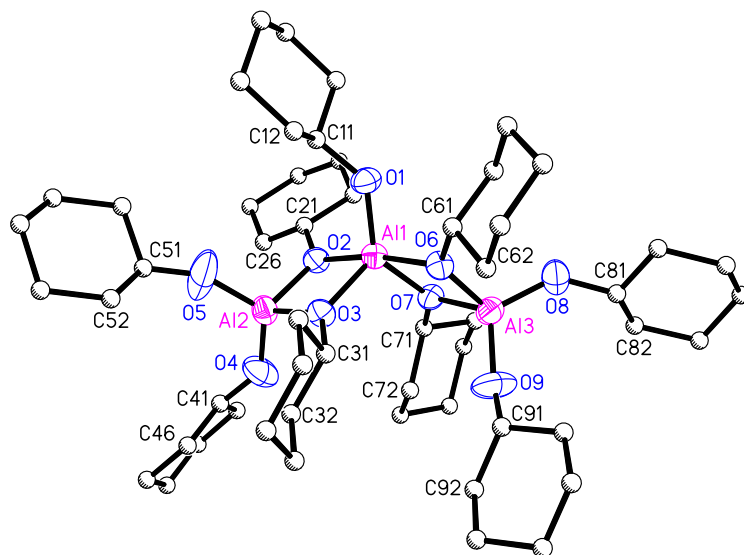
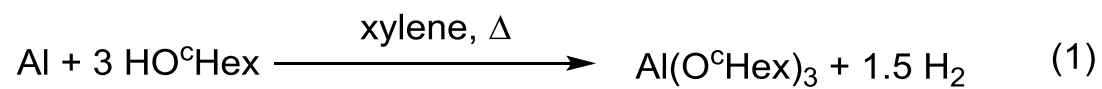
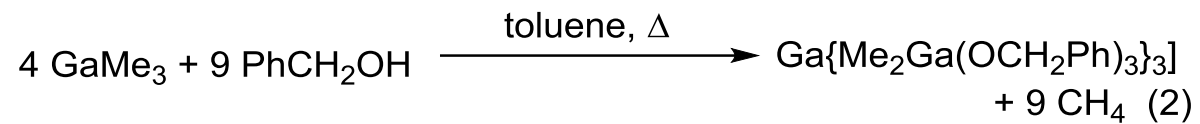


fig. 1

Reaction of Trimethylgallane with PhCH₂OH leads to a sesquialkoxide according eqn. (2).



The structure of this sesquialkoxide is shown in fig. 2.

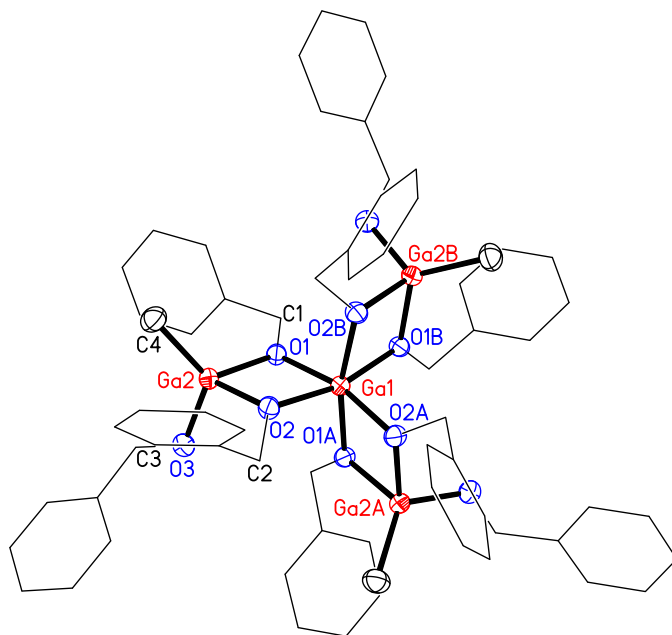
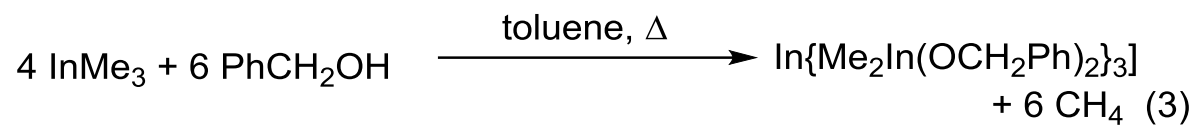


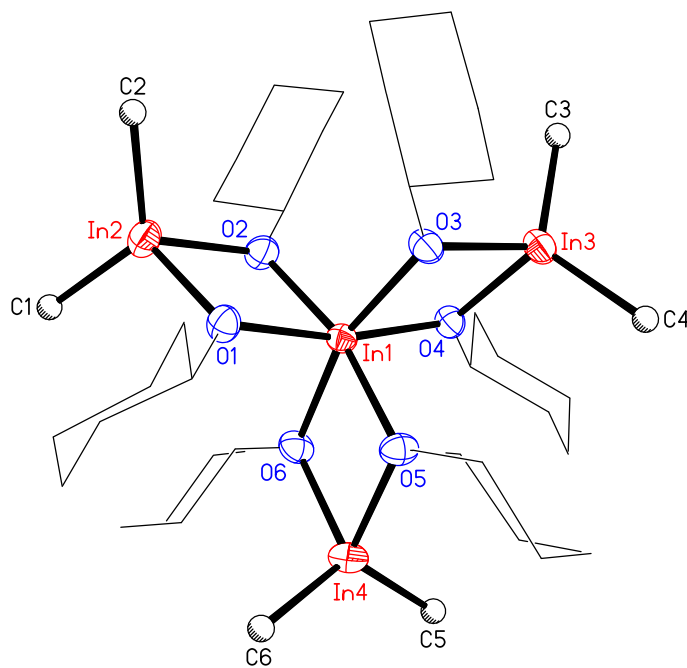
fig. 2

With HexOH and InMe_3 another type of sesquialkoxide was formed according to eqn. (3).



The structure is similar, shown in fig. 3.

fig. 3



Me_3Ga and two equivalents of alcohol gives $\text{MeGa}(\text{OR})_2$ according eqn. (4) which are polymeric in the solid state (fig. 4).

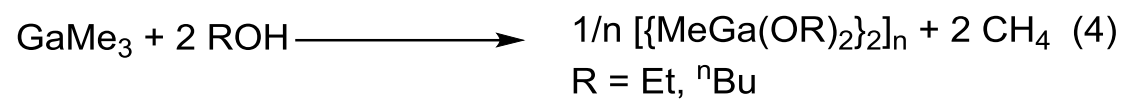
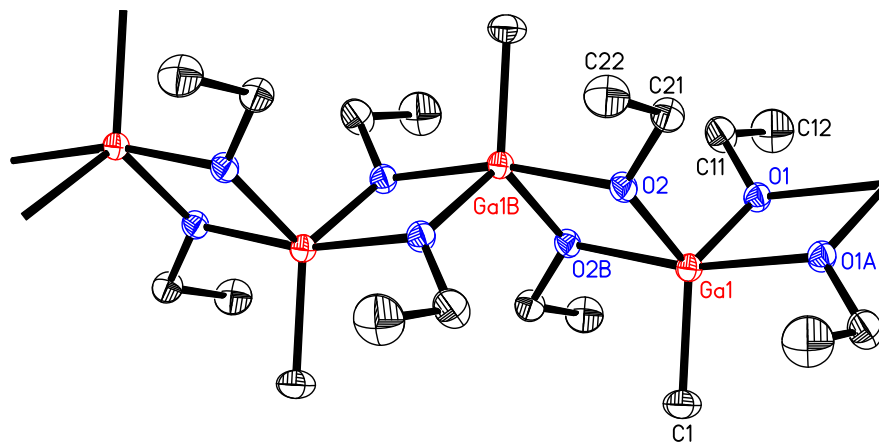
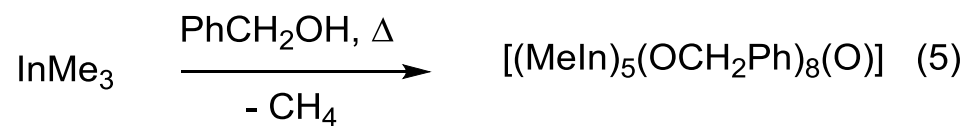


fig 4



InMe₃ undergoes in PhCH₂OH under reflux conditions the reaction to a complex with five In atoms (eqn. 5).



The complex is shown in fig. 5.

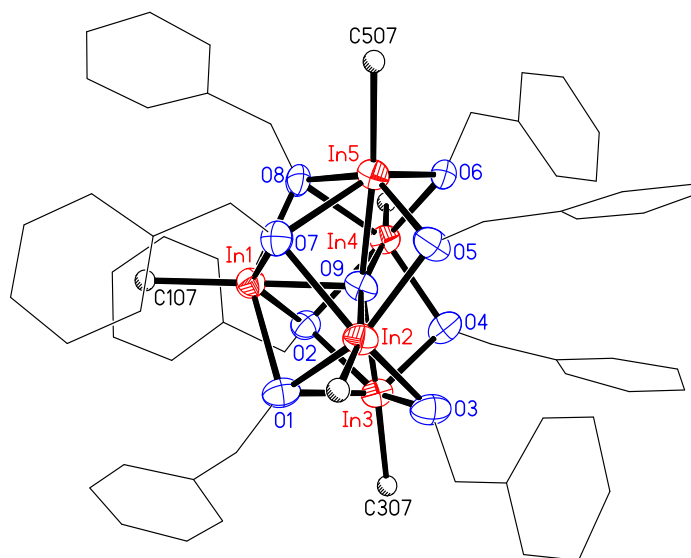
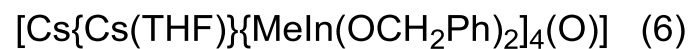
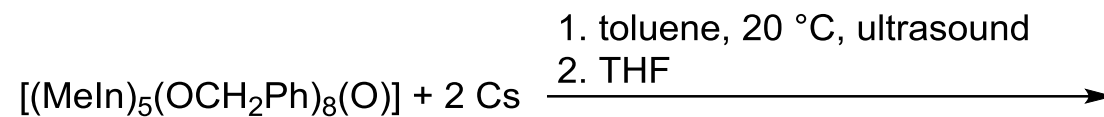
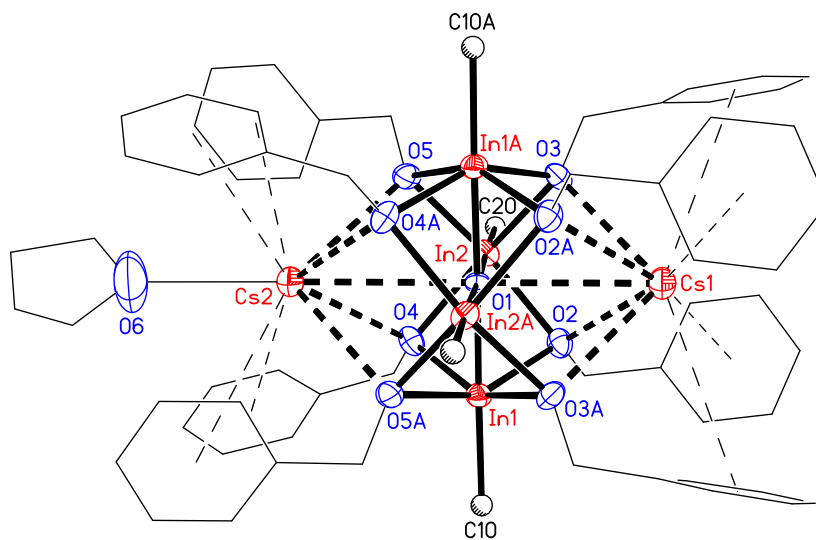


fig. 5

Reaction of $[(\text{MeIn})_5(\text{OCH}_2\text{Ph})_8(\text{O})]$ with cesium in organic solvents under ultrasonic conditions leads to a Cs complex according eqn. (6).



In the cesium complex the Cs^+ -Ions are coordinated by oxygen atoms and the π -systems of the OCH_2Ph ligands (fig. 6).



Literature:

B. Neumüller: *Chem. Soc. Rev.* **2003**, 32, 50.

Th. Kräuter: *Chem. Eur. J.* **1997**, 3, 568.

S. Chitsaz: *Z. Anorg. Allg. Chem.* **2001**, 627, 2451.

S. Chitsaz, E. Iravani, B. Neumüller, *Z. Anorg. Allg. Chem.* **2002**, 628, 2279.

N. Nami Chamazi, M. M. Heravi, B. Neumüller, *Z. Anorg. Allg. Chem.* **2007**, 633, 709.