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# PHASE TRANSITIONS AND SOME PHYSICAL PROPERTIES IN FLUORIDES AND OXIDE FLUORIDES CONTAINING MONOVALENT SILVER

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Several fluorides and oxide fluorides containing monovalent silver have been obtained by direct synthesis in sealed gold tubes between 400 and 600°C depending on the starting materials. In every case the solid state reaction has been completed by a gentle fluorination.

The structure of these materials is essentially connected to the following families :

- $(\text{NH}_4)_3\text{AlF}_6$  and related structures :  $\text{Ag}_3\text{MF}_6$  ( $\text{M} = \text{Al}, \text{V}, \text{Cr}, \text{Fe}, \text{Co}, \text{Ga}, \text{In}$ ),  $\text{Ag}_3\text{TiOF}_5$ ,  $\text{Ag}_3\text{NbO}_2\text{F}_4$ ,  $\text{Ag}_3\text{WO}_3\text{F}_3$
- chiolite :  $\text{Ag}_5\text{M}_3\text{F}_{14}$  ( $\text{M} = \text{Al}, \text{V}, \text{Cr}, \text{Fe}, \text{Ga}$ ),  $\text{Ag}_5\text{Ti}_3\text{O}_3\text{F}_{11}$ ,  $\text{Ag}_5\text{W}_3\text{O}_9\text{F}_5$ .

In the former family, a few compounds crystallize with a cubic structure. For all the others, phase transitions have been detected by DTA and microcalorimetry. The high-temperature forms (cubic,  $\text{Fm}3\text{m}$ ) have been characterized by X-ray study using a Guinier-Simon camera. The following transition temperatures have been found :

M	Al	Ti	V	Cr	Fe	Ga	In
$T_{\text{tr}}(\text{K})$	343	343	433	453	433	438	583

In the latter family, the magnetic behavior has been investigated when the trivalent cation is a 3d-element. The phases  $\text{Ag}_5\text{M}_3\text{F}_{14}$  are ferromagnetic ( $T_{\text{C}} = 12 \text{ K}$  for  $\text{M} = \text{V}$  ;  $T_{\text{C}} = 14 \text{ K}$  for  $\text{M} = \text{Cr}$  ;  $T_{\text{C}} = 80 \text{ K}$  for  $\text{M} = \text{Fe}$ ). The Curie temperatures are close to those found for the corresponding sodium phases.

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