

NOVEL ROUTES TO THE SYNTHESIS OF METAL FLUORIDES

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To avoid the growing of single crystals of a metal fluorides from its own melt we used 3 different routes:

1) TlF can be used as a flux. (e.g.

$a\text{-Ba}_3\text{In}_2\text{F}_{12}$, Sr_2InF_7 , TlZrF_5 and $\text{Ba}_5\text{Mn}_3\text{F}_{19}$, this isotypic with new $\text{Ba}_5\text{Ga}_3\text{F}_{19}$.

2) By thermal decomposition of fluorides of high oxidation state

under proper conditions we obtained red-liliac single crystals of

A_3MnF_6 ($\text{A} = \text{K}, \text{Rb}, \text{Cs}$; HT-forms), transparent dark brownishred crystals of A MnF_4 ($\text{A} = \text{Li-Cs}$), and $\text{M}^{\text{II}}\text{MnF}_5$ ($\text{M}^{\text{II}} = \text{Ca}, \text{Sr}, \text{Cd}$) as winered clear transparent specimens.

3) Using the otherwise feared 'reaction with the wall' it is possible

to grow single crystals of yellow KNiF_3 and RbNiF_3 starting with K_2NiF_6 or RbNiF_6 . These and similar reactions like $\text{NaTlF}_4 + \text{NaTl}$ or $\text{NaTlF}_4 + \text{Cu}$ yeald single crystals at surprisingly low temperatures (e.g. Tl_2CuF_4 : colourless, 500°C , 10d).

The result are demonstrated in detail with an additional remark on the results of exchange reactions.