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POSSIBLE INTERPRETATIONS AT THE FORMATION OF CRYSTALLINE FLUOROMETALATES HAVING MONOMERE ANIONS AS PRIMARY PHASES IN PROGRESS OF A SOLID STATE REACTION

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Many reactions of K_2SiF_6 with oxides and double oxides were investigates with regard to their first crystalline products. The following connections seem to exist between the initial products and the primary reaction compounds.

The metal of the applied oxide takes the place of the central atom in a complex fluoride or in an oxofluoride.

In the first case of defined metal atoms the stoichiometric proportions of the initial powder mixtures can vary in a wide range without any influence of the formation of crystalline reaction products. But only one main structure type is always favoured in crystallization, it is a variant of the Elpasolite-type respectively Perowskit-type with isolated anion complexes. These anion-complexes co-determine the mechanism of the reaction essentially and the formed substances are true fluorometalates or oxofluorometalates, extensively. Examples are: K_3AlF_6, K_3ZrF_7, K_3TiOF_5, $K_3NbO_2F_4$, $K_3WO_3F_3$.

In the other case the stoichiometric proportions of the reaction mixtures influence the formation of the primary phase very sensitively. There does not exist any effect of an anion-complex and only individual particles restrain the reaction. The formed substances must be characterized as double fluorides or ternary fluorides ($KCaF_3$, $KPbF_3$, K_3SEF_6) with SE-rare earth elements.