

Analytical and graphical correlation between eutectic temperatures (minimum) and compositions of binary halide systems

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Abstract

Analytical description and graphical correlation were obtained between eutectic temperatures (minimum) of the two-component salt systems containing fluorides, bromides and iodides of potassium, rubidium and cesium NaF – MF, NaBr – MBr, NaI – MI (M – K, Rb, Cs) and the eutectic points of the NaCl – MCl chloride systems. On the basis of the dependences obtained, the lowest melting points of the unstudied francium halides NaF – FrF, NaBr – FrBr, NaI – FrI systems were predicted.

In the same way the dependences between the eutectic temperatures of the MF – MHal (M – K, Rb, Cs, Hal – Cl, Br, I) systems and the eutectic temperatures of the LiF – LiHal systems were plotted and described. The lowest melting temperatures of the uninvestigated NaF – NaAt, KF – KAt, RbF – RbAt systems were predicted.

On the basis of a number of the interrelations, the possibility of an approximate calculation of the low melting compositions contents of the unstudied systems was shown.

The dependences between the MHal content (M – Na, K, Rb, Cs, Hal – F, Br) of the LiHal – MHal systems and the MCl content of the LiCl–MCl systems were described. A forecast was given for the low melting compositions contents (% mol.) of the unstudied systems containing the francium salts LiF – FrF, LiBrFrBr.

The components content of the CsF – CsAt system was predicted depending on the correlation between contents of CsHal (Hal – Cl, Br, I) in the CsF – CsHal series and MHal (M – Li, Na).

The content of the components in the NaF – FrF, NaBr – FrBr, NaI – FrI systems was predicted depending on the content of MHal (M – K, Rb, Cs, Hal – F, Br, I) in the NaHal – MHal series and the content of MCl in the LiCl – MCl series.

The components content of the NaF – NaAt, KF – KAt systems was predicted as a function of the content of MHal (M – Na, K Hal – Cl, Br, I) in the MF – MHal series and the LiHal content in the LiF – LiHal series.

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