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THE THERMAL DECOMPOSITION OF THE ALKALIN EARTH MONOFLUORO-PHOSPHATES

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The thermal decomposition of alkalin earth monofluorophosphates was investigated by thermogravimetry under inert conditions. A parallel mass spectrometric analysis of gases produced is made using an effusion cell a quasi equilibrium evaporation in the nearness of the ion source of the spectrometer is achieved. The results of investigations which are obtained in this way are comparable with the thermogravimetric analysis under normal pressure. The additional use of IR-spectroscopy and X-ray diffraction patterns permit an interpretation of the thermogravimetric effects. The mechanism of the decomposition of the alkaline earth monofluorophosphates depends on the amount of the water of crystallization of the starting compound. During first state of decomposition of $CaPO_3F.2H_2O$ one mole water is losing. Then an hydrolysis is caused by the water of crystallization. The products of hydrolysis, HF and $Ca_2P_2O_7$, react to POF_3 in two steps in the temperature range from 200 °C to 450 °C. Contrary to this behaviour $BaPO_3F$ is relatively stable. The decomposition started not before 650 °C and POF_3 is formed directly. The consideration of both mechanism is necessary in order to describe the decomposition of $SrPO_3F.H_2O$.