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Experimental studies of magmatic differentiation of phosphor enriched
Li-F granite systems and concentration mechanism of Sn and W.

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At 800oC and under 200 MPa pressure of the H-O-C fluid system in the moderate reducing conditions (stability of magnetite) in the phosphor enriched Li-F granite melts contained closely connected with natural concentrations of F, P2O5 and H_2O the superliquidus nano-cluster cryptic and contrasting layering of Qz-Fsp type is generated. The Sn and W in the experimental samples as well as in the phosphor enriched Li-F granite system of the Podlesi, Czech Republic are concentrated in the melts enriched by F and P2O5.The experiments were carried out in the internally heated gas high pressure vessel. The initial charges were homogeneous glasses obtained by melting of Podlesi Li-F granite system middle composition. The improved Shaw membrane technique is useful to control in experiments the hydrogen content of the fluid phase. The hydrogen fugacity was controlled by an argon-hydrogen mixture in the Re-reactor and was 0.12 MPa. At the interaction of phosphorus and fluorine with Podlesi Li-F granite melt in the presence of H-O-C system fluid in the absence of the thermal gradient and constancy of all other thermodynamic parameters, these develop cryptic layering, a gradual alteration of liquid composition along the sample height and appearance of layers (“lenses”) enriched by silica. The origin of heterogeneities is connected to the formation of fluctuating more ordered structures-nano-clusters, which exchange particles and energy with matrix of melt. The depolymerization of melt affects the cluster formation. The degree of silicate melt depolymerization is stipulated by dissolution in the latter of volatiles, specially of hydrogen, phosphorus and fluorine: their presence increases water solubility and depolymerization. The behaviour of clusters cannot be predicted by “classical” chemical principles: various studies on such diverse properties as ionization potentials and nearest neighbour distance has shown that the values for clusters of an element is intermediate between that obtained for its individual atoms and the bulk crystal. As it was shown experimentally under certain critical thermodynamical conditions the aggregate of nano-clusters are capable of the gravitational movement with the accumulation liquids enriched by quartz or feldspar. While reaching the concentration of fluid enough for a cluster differentiation this melt develop with formation of the layered rocks between which fluid and other components are distributed including of Sn and W and et. al.