**Crystal Structure of $KLiSO_4$ at High Temperatures**

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Above room temperature there are three modifications of $KLiSO_4$ ; i.e. phase I, II and III. Phase transitions temperatures between them are 435°C and 668°C respectively. The x-ray diffraction intensities of phase I at about 700°C and of phase II at about 600°C were collected on the CAD4 single crystal diffractometer equipped a self-made furnace. During collection of intensities data, a prominent decay of intensities was observed. The crystal structure of phase I is the tridymite derivatives with ordered arrangement of $SO_4$- and $LiO_4$-tetrahedra similar to that of phase III. The statistical data of the structure refinement for phase I with polar space group of $P6_3mc$ was R = 0.057, Rw = 0.056 and S (goodness-of-fit) = 1.859. The crystals of phase II usually exhibit misleading hexagonal twinned cell which is composed of three orthorhombic twin domains in the temperature range between 435°C and 668°C. An almost twin-free single crystal of Phase II was observed at the elevated temperature. The crystal structure of phase II was refined with this crystal is orthorhombic with the polar space group $Pc2_1n$. The final statistical data was R = 0.077, Rw = 0.073 and the S = 1.028 with ordered arrangement of atoms. This data was compared with that of the twinned crystal corrected with twin ratio and further discussed previously reported disordered model with the space group of Pmcn.

**Keywords: KLiSO4, structure analysis, high temperature**