Effect of the Anticaking Agent FeCN on the Creeping Properties of Alkali Halide Crystals

Blijlevens MAR[1], Rownsend ER[1], Tinnemans P[1], van Enckevort WJP[1], Vlieg E[1].Author AA[1], * e.vlieg@science.ru.nl
1 Radboud University, Institute for Molecules and Materials, Nijmegen, The Netherlands

Iron cyanide ($Fe(CN)_6^{4-}$; abbreviated as FeCN) is a well-known anticaking agent for NaCl that has a nearly perfect geometrical fit to the (001) surface. In this work, the investigation of the action of FeCN on nucleation and creeping is extended to a wide range of alkali halides of both the NaCl and CsCl structure [1].

It was found that FeCN is a powerful nucleation inhibitor and enhances the creeping of alkali halides when FeCN geometrically fits well in the octahedral surface site of hosts with the NaCl crystal structure. The tested alkali halides that do not fall in this group or that have the CsCl structure show some reduction in creeping upon addition of FeCN, while NaF and LiCl did not show a difference. For this category of crystals there is a poor fit of the FeCN ion in the crystal surface. This study shows that a strong adsorption strength of FeCN enhances creeping, whereas a weak interaction reduces the creeping of alkali halide crystals.

[1] Blijlevens MAR et al., Effect of the Anticaking Agent FeCN on the Creeping Properties of Alkali Halide Crystals, Cryst. Growth Des. 2022, 22, 6575-6581.