Effect of Crystal Growth on Liquid-like Droplets Formation in the hcp Solid Helium

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The samples of hcp solid helium (1% ^{3}He in ^{4}He) are studied by NMR technique. Samples are grown by blocked capillary method under different growth rates (about 8, 2, and 0.08 mK/s). NMR technique is used for phase identification by measurements of diffusion coefficient D and spin-spin relaxation time T_2 at temperatures of $1.3 - 2.0$ K and pressures of $34 - 36$ bar. Along with D and T_2 for the hcp phase, we simultaneously observed the D and T_2 typical for liquid for growth rates 8 and 2 mK/s. That means liquid-like inclusions quenched from melting curve during fast crystallization of the samples. It is also shown that the slower growth rate corresponds to smaller size of liquid-like droplets that results from lower spatially restricted values of D and, finally, absence of these inclusions at the longest crystallization times. The diffusion coefficient measured for liquid-like droplets is also decreasing during the NMR experiment at constant temperature that indicates the size reducing of these droplets. Liquid-like droplets are shown to disappear after sample annealing nearby the melting curve.