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Nuclear magnetic relaxation of 3He in contact with an aerogel above the Fermi temperature

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Abstract

The spin kinetics of 3He in an aerogel has been studied above the Fermi temperature. The magnetic relaxation times T 1 and T 2 of adsorbed, gaseous, and liquid 3He in a 95% silica aerogel at a temperature of 1.5 K have been determined as functions of frequency by means of pulse nuclear magnetic resonance. It has been found that the time T 1 is linear in frequency in all three cases, whereas T 2 is independent of frequency. To explain the observed behavior of the longitudinal relaxation rate, a theoretical model of relaxation in the adsorbed layer of 3He taking into account the filamentary structure of the aerogel is proposed. © 2008 Pleiades Publishing, Ltd.

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