Mössbauer Spectroscopic Studies of $(Me_2NH_2)_2SnX_6$ (X = Cl or Br) and Their Related Complexes

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The temperature dependence in the ^{119}Sn Mössbauer spectral area for $\{(CH_3)_2NH_2\}_2SnCl_6$ was found to be almost linear, although a phase transition of the complex has been suggested by IR,[35]Cl NQR and NMR studies, while an anomaly in the temperature dependence for $\{(CH_3)_2NH_2\}_2SnBr_6$ was found at ∼235 K, which is close to the phase transition temperature ∼253 K determined by ^{89}Br NQR. These differences are attributable to molecular motion of the dimethylammonium ion in the complexes. The X-ray powder diffraction pattern of $\{(CH_3)_2NH_2\}_2SnCl_6$ did not change near the phase transition point, but that of $\{(CH_3)_2NH_2\}_2SnBr_6$ changed at 108 - 123 K and 233 - 253 K.

Key words: Mössbauer Spectroscopy; Phase Transition; SnX_6^{2-} Ion; Molecular Motion.