

NQR and DSC Studies on Structural Phase Transitions and Lattice Stability in Some Tetrabromozincate(II) Compounds A_2ZnBr_4

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The temperature dependence of ^{81}Br NQR frequencies in some tetrabromozincate(II) compounds, pyridinium tetrabromozincate(II) $(\text{pyH})_2\text{ZnBr}_4$, 4-picolinium tetrabromozincate(II) $(4\text{-piH})_2\text{ZnBr}_4$, 2,6-lutidinium tetrabromozincate(II) $(2,6\text{-luH})_2\text{ZnBr}_4$ and guanidinium tetrabromozincate(II) $(\text{guH})_2\text{ZnBr}_4$, were measured between 77 K and temperatures where signals faded out. All compounds exhibited four NQR signals over the whole temperature range investigated. Moreover, DSC was measured between about 130 K and melting points. $(4\text{-piH})_2\text{ZnBr}_4$ and $(\text{guH})_2\text{ZnBr}_4$ showed no structural phase transition, while $(\text{pyH})_2\text{ZnBr}_4$ and $(2,6\text{-luH})_2\text{ZnBr}_4$ showed a single phase transition. The values of transition entropies obtained suggest that these transitions are of the order-disorder type. The nature of these transitions and the lattice stability in the present compounds were discussed.

Key words: NQR; DSC; Phase Transition; Transition Entropy; Tetrabromozincate.