

Bromine and Antimony NQR of 4-Aminopyridinium Tetrabromoantimonate(III)

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Z. Naturforsch. **57 a**, 469–472 (2002); received April 9, 2002

*Presented at the XVth International Symposium on Nuclear Quadrupole Interactions,
Hiroshima, Japan, September 9-14, 2001.*

The temperature dependences of T_1 and T_2 of ^{81}Br and ^{121}Sb NQR have been measured in order to study the phase transition at $T_c = 224$ K as well as the crystal dynamics in 4-aminopyridinium tetrabromoantimonate(III) ($4\text{-NH}_2\text{PyHSbBr}_4$). The temperature dependence of T_1 of ^{81}Br and ^{121}Sb NQR follows the usual T^2 law in the range from 80 to 120 K. T_1 is dominated by fluctuations of the EFG at the Br and Sb nuclei due to lattice vibrations.

The T_1 vs. $1/T$ curves in the region between about 120 and 140 K can be described by exponential curves. The activation energies of motions obtained from these curves are similar to those from proton NMR. The exponential changes of T_1 of Br and Sb NQR are attributable to fluctuations caused by the thermal motion of $4\text{-NH}_2\text{PyH}$ cations.

Echo signals of Br and Sb NQR in the low temperature phase could not be detected at temperatures higher than 145 and 150 K, respectively, because the S/N ratios became poor owing to the very short T_2 . The echo signals could also not be detected at temperatures above T_c because of the short T_2 .

Key words: $4\text{-NH}_2\text{PyHSbBr}_4$; Phase Transition; ^{81}Br NQR, ^{121}Sb NQR.