^{35}Cl Quadrupole Relaxation Study on $Cs_2[Au(I)Cl_2][Au(III)Cl_4]$ and $Cs_2[Ag(I)Cl_2][Au(III)Cl_4]$

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Two ^{35}Cl NQR spin echo signals, ν_{Q1} = 17.28 MHz (Au(I)-Cl) and ν_{Q2} = 27.10 MHz (Au(III)-Cl), have been observed at 77 K from two samples of $Cs_2[Au(I)Cl_2][Au(III)Cl_4]$ prepared differently. The resonances resulted at the same frequencies but with different line widths. $Cs_2[Ag(I)Cl_2]$-$[Au(III)Cl_4]$ yielded a singlet, ν_{Q2} = 27.96 MHz, at 77 K. The three samples gave rise to ESR signals indicating the presence of paramagnetic Au(II) or Ag(II) sites with low concentration. ^{35}Cl NQR spin-lattice relaxation time T_{1Q} measurements revealed that only the reorientational motions of the anions $[Au(III)Cl_4]^-$ are exited at high temperatures.

Key words: ^{35}Cl NQR Spin-lattice Relaxation; Mixed-valence Complex; Reorientational Motion; Lattice Vibration; ESR.