Mössbauer spectroscopy of $^{129}$I and $^{197}$Au nuclei has been applied for AuI and AgAuI$_2$ to clarify the electronic structures of the gold and iodine atoms, and to investigate the nature of the Au-I bonds. In the $^{129}$I Mössbauer spectra the sign of $e^2qQ$ is positive for AuI, whereas the sign is negative for AgAuI$_2$. This is attributable to the difference in molecular structures: The iodine atom in AuI is bridged by two gold atoms and in AgAuI$_2$ the iodine is terminal. The $^{197}$Au Mössbauer spectra suggest that the Au-I bond in AgAuI$_2$ is more covalent than that in AuI. We have revealed that AgAuI$_2$ consists of Ag$^+$ and linear [I-Au-I]$^-$ units from the Rietveld refinement of the X-ray powder diffraction pattern.

**Key words:** $^{129}$I Mössbauer Spectra; $^{197}$Au Mössbauer Spectra; Rietveld Analysis; Electric Field Gradient; Isomer Shift.