BORONYL MIMICS GOLD: A PHOTOELECTRON SPECTROSCOPY STUDY

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Previous studies have found that gold atom and boronyl bear similarities in bonding in many gas phase clusters.[a] [b] [c] [d] $B_{10}(BO)$, $B_{12}(BO)$, $B_3(BO)_n$ (n=1, 2) were found to possess similar bonding and structures to $B_{10}Au$, $B_{12}Au$, B_3Au_n (n=1, 2), respectively. During the recent photoelectron spectroscopy experiments, the spectra of $BiBO^-$ and $BiAu^-$ clusters are found to exhibit similar patterns, hinting that they possess similar geometric structures. While $BiAu^-$ is a linear molecule, $BiBO^-$ is also linear. The similarity in bonding between $BiBO^-$ and $BiAu^-$ is owing to the fact that Au and BO are monovalent σ ligands. The electron affinities are measured to be 1.79$\pm$0.04eV for $BiBO^-$ and 1.36$\pm$0.02eV for $BiAu^-$. The current results provide new examples for the BO/Au isolobal analogy and enrich the chemistry of boronyl and gold.

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