

## 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.<sup>a b c</sup>  $B_{10}(BO)$ ,  $B_{12}(BO)$ ,  $B_3(BO)_n$  ( $n=1, 2$ ) 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  $\sigma$  ligands. The electron affinities are measured to be  $1.79 \pm 0.04 eV$  for  $BiBO^-$  and  $1.36 \pm 0.02 eV$  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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<sup>a</sup>H.-J. Zhai, C.-Q. Miao, S.-D. Li, L.-S. Wang, *J. Phys. Chem. A* 2010, 114, 12155–1216

<sup>b</sup>Q. Chen, H. Bai, H.-J. Zhai, S.-D. Li, L.-S. Wang, *J. Chem. Phys.* 2013, 139, 044308

<sup>c</sup>H. Bai, H.-J. Zhai, S.-D. Li, L.-S. Wang, *Phys. Chem. Chem. Phys.*, 2013, 15, 9646–9653

<sup>d</sup>H.-J. Zhai, Q. Chen, H. Bai, S.-D. Li, L.-S. Wang, *Acc. Chem. Res.* 2014, 47, 2435-2445