VCU Innovation Gateway
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Hyperhalogens

A new class of highly electronegative species

Highly electronegative molecules, such as halogens and superhalogens, are extremely good oxidizing agents. Also, their ability for form stable salts has led to their wide use in disinfectants, air purifiers. These molecules have even been implicated as a treatment option for patients with depression. Thus, further research into these highly electronegative clusters has the potential to develop new species with even higher electron affinities.

The technology

A VCU researcher, in conjunction with researchers from the University of Konstanz and McNeese State University, has developed a new class of highly electronegative clusters known as "hyperhalogens". Hyperhalogens were formed by surrounding a central metal atom or multi-metal core with superhalogen molecules. These clusters can serve as better oxidizing agents compared to superhalogens alone, and their ability to trap halogen atoms makes them suitable for biological decontamination. Additional applications include air purification and hygiene improvement. Furthermore, hyperhalogens may increase serotonin release in blood, which may aid treatments for depression.

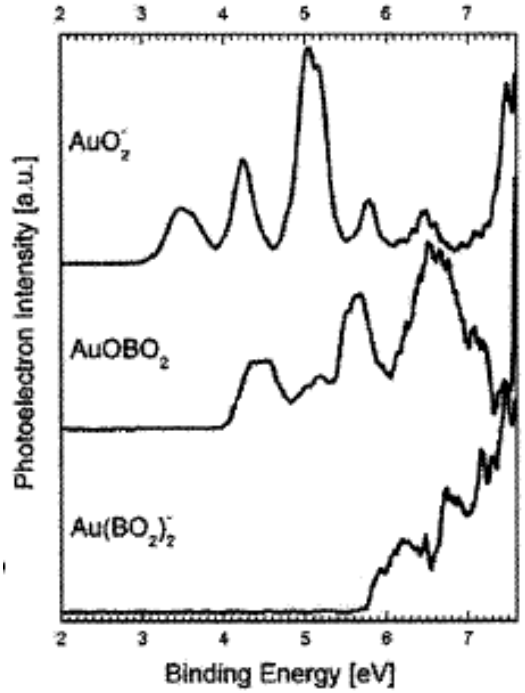

Figure 1. *Comparison of photoelectron spectra of $Au(BO_2)_2^-$, $AuO(BO_2)$, and AuO_2 clusters.*

Benefits

- Higher electron affinity than current superhalogens
- Potential to create a new series of super- oxidizing agents

Applications

- Oxidizing agent
- Biological decontamination
- Air purification
- Hygiene improvement
- Potential aide in the treatment of depression
- Novel magnetic materials

Patent status:
Patent issued: U.S. and foreign rights are available.

License status:
This technology is available for licensing to industry for further development and commercialization.

Category:
Biomedical

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External resources:
US 9,416,016 B2
Willis, M., et al. (2010)

Contact us about this technology

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