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Understanding materials based on the electron work function

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Properties of materials are fundamentally dependent on their electron state that governs the atomic and molecular interactions, which consequently affect their performance during various mechanical, physical and chemical processes. The electron behavior is largely reflected by the electron work function, which is the minimum energy required to move electrons at the Fermi level inside a material to its surface. With this simple characteristic parameter, many material intrinsic properties and processes could be analyzed without involving complex theoretical treatments. Not only helps understand the origins of material properties and relevant phenomena on an electronic base in simple ways, this characteristic parameter also provides complementary clues for new material design. This talk will be focused on the correlation between the electron work function and mechanical properties of materials. Sample applications of the electron work function in analyzing, understanding and designing materials will be discussed.

Biography

D.Y. Li is a Professor at Department of Chemical & Materials Engineering and an Adjunct Professor at the Department of Biomedical Engineering, University of Alberta. His research interests include surface science and engineering, tribology and materials, computational materials science, photocatalysts, and bacteria-metal interfaces. He has more than 250 publications including 200 refereed journal publications. He is the Editor-in-Chief of the *International Journal of Nano & Biomaterials* and a member of editorial board for seven other journals in areas of materials, tribology, wear, and corrosion.

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