Wednesday Afternoon, May 22, 2024

Awards Ceremony and Honorary Lecture
Room Town & Country A - Session HL-WeHL

Bunshah Award Honorary Lecture

6:05pm **HL-WeHL-2 R.F. Bunshah Award and ICMCTF Lecture Invited Talk: Making More Wear-Resistant Surfaces via Tribochemistry – from Cutting Tools to Flying Things***, Yip-Wah Chung (ywchung@northwestern.edu)*[1], Northwestern University, USA **INVITED**

To most of us in the metallurgical coating community, making a component more durable against wear means providing a wear-protective coating appropriate to the substrate of that application. Given that wear is a system parameter, it is prudent to consider other components in the tribological system that can be exploited to provide enhancements of its wear resistance, particularly within lubricated systems. Remarkably, some materials, even under modest contact conditions, can interact with lubricants to produce lubricious, wear-protective carbon-based films. These tribochemical reactions offer a route to apply a renewable, protective coating precisely when and where it is needed. In other instances, having the appropriate surface chemistry may increase residence time of lubricant molecules, thus amplifying their wear protection. Exploring tribochemistry as a means to making more durable surfaces across a broad range of systems is a promising avenue of enquiry. Whether through designing specialized coatings, selecting alloy substrates with optimum compositions and microstructures, or refining lubricant formulations, we will delve into the scientific basis of this approach. We will discuss examples of coatings used for cutting tools and protective overcoats in computer disk drives to components in vehicle power systems and speculate on potential directions for future explorations.

[1] **R.F. Bunshah Awardee**

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