Bringing Electrochemistry to the Streets: Hybrid Electric Vehicle Battery Reconditioning

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Abstract:  
A growing number of automobile service shops are performing high throughput chronopotentiometry on nickel metal hybrid vehicle battery packs to erase “memory effects” resulting from the shallow depth of discharge subjected to traction battery modules. This presentation describes conditions that lead to memory effects and details concerning the wave form generation required to erase memories. Reconditioning yields aftermarket battery modules. Batteries with state-of-health parameters precluding aftermarket inclusion can be repurposed. The increase in amp-hour and watt-hour capacity when repurposed for greater depth of discharge is discussed. This talk is geared to battery electrochemistry beginners and hybrid vehicle repair engineers.

Eugene Smotkin obtained his Ph.D. from the University of Texas at Austin in 1989. Dr. Smotkin co-founded NuVant Systems in 1999 and is Chairman of the Board of Directors. He is a Professor in the Department of Chemistry and Chemical Biology at Northeastern University in Boston. He has over 20 years experience in fuel cell R&D; awarded over $14 million in government and industry grants, has over 100 peer-reviewed articles and 8 patents. He was admitted as a Fellow of the Society of Innovators of Northwest Indiana in 2013. He is a member of the American Chemical Society and the Electrochemical Society and is the Faculty adviser to the Boston Electrochemical Society Student Chapter.