From Zintl to Electride to Semiconductor: New Materials for Energy Conversion

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Many technologies are limited by existing materials, which hinder progress toward higher efficiencies and wider application. This seminar will outline the requirements for efficient energy conversion from waste heat directly to electricity in thermoelectric applications, highlighting properties of new compounds of the Ca14AlSb11 structure type as well as the evolution of properties of an electride, Yb5Sb3, transitioning to a hydride, Yb5Sb3Hx. Compounds with the Ca14AlSb11 structure are among the most efficient p-type thermoelectric materials. The synthesis and unique properties of several new compositions will be presented. Compounds with a composition of 5-3 are known as electrides, materials where an electron functions as an anion. These electrides can also absorb hydrogen, forming a hydride and altering the properties from those of a semi-metal to a semiconductor. This work focuses on investigating an electride-hydride solid solution and characterizing its properties. This presentation will demonstrate the power of chemical principles in discovery.

The link to my website is: [https://chemistry.ucdavis.edu/people/susan-kauzlarich](https://nam10.safelinks.protection.outlook.com/?url=https%3A%2F%2Fchemistry.ucdavis.edu%2Fpeople%2Fsusan-kauzlarich&data=05%7C02%7Cschamberlain%40ku.edu%7C623e24158fd24d8f9c9c08ddd604b2c0%7C3c176536afe643f5b96636feabbe3c1a%7C0%7C0%7C638902038446668253%7CUnknown%7CTWFpbGZsb3d8eyJFbXB0eU1hcGkiOnRydWUsIlYiOiIwLjAuMDAwMCIsIlAiOiJXaW4zMiIsIkFOIjoiTWFpbCIsIldUIjoyfQ%3D%3D%7C0%7C%7C%7C&sdata=MxkE8g1xsd147XOW845YEqXvKsLjF%2BH5rpAIQmI2ip8%3D&reserved=0)

