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Measurement of Single Molecule Conductance JOSHUA HIHATH, XIULAN LI, FANG CHEN, NONGJIAN TAO, Arizona State University, DEPTARTMENT OF ELECTRICAL ENGINEERING; CENTER FOR SOLID STATE ELECTRONICS RESEARCH TEAM — Understanding the electron transport properties of single molecules is a basic requirement for achieving molecular-scale electronic devices reliable enough for everyday use. To help elucidate the transport mechanisms involved in various single metal-molecule-metal junctions we have performed measurements while applying an electrochemical gate, changing the environmental temperature, the chemical binding at the contacts, the bias, and the molecular length in an STM break junction system. Using this system and these handles to help elucidate conduction mechanisms we have explored several molecular systems, including simple alkane chains, conjugated redox molecules, and biologically relevant molecules such as DNA and proteins, in all cases we have gained some insight into the transport capabilities of each metal-molecule system.

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