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**Design, Synthesis and Characterization of Polymerizable Terminal Diacetylene Salts.** Zhong Li, Frank W. Fowler, Joseph W. Lauher, Dept. of Chemistry, State Univ. of New York, Stony Brook, NY, 11794.

**Polydiacetylenes (PDAs)** have attracted great interest due to their potential uses as advanced materials. **PDAs** are commonly prepared by 1,4 polymerization of **diacetylene** monomers in the solid state. Recently, we have reported the first single-crystal-to-single-crystal polymerization of a terminal **diacetylene**. Herein, we developed a general crystal engineering approach of controlling the packing of cationic guest molecules guided by the crucial hydrogen bonds between anionic host molecules. As an application, we have prepared a series of new terminal **diacetylene** monomers, including aryl terminal **diacetylenes**. They were successfully arranged via host-guest chemistry in patterns suitable for solid state 1,4 polymerization. The heat-induced polymerization of these **diacetylenes** has been carefully followed using X-ray diffraction.