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Will present a seminar on

# "STRUCTURE CONTROL IN IMMISCIBLE POLYMER BLENDS: APPLYING INSIGHTS FROM OIL/WATER SYSTEMS"

Immiscible homopolymers are often blended together to achieve properties not possible with a single homopolymer. We will describe the effect of interfacial modifiers on the structure and rheology of polymer blends. We will also discuss attempts to transplant existing strategies of structure control from small-molecule two-phase systems, e.g. mayonnaise, to immiscible polymer blends.

As a first example of interfacial modifiers we will consider block copolymers, which are often used to promote blending of immiscible polymers. Experiments show significant rheological consequences due to added diblock copolymer e.g. as little as 0.1 wt.% copolymer can double the blend viscosity. Such large rheological effects are attributable to interfacial immobilization induced by the added copolymer. Interfacial immobilization can also explain why the copolymer can suppress coalescence in some cases, a phenomenon that may be exploited to manipulate blend morphology similar to how a surfactant can manipulate the structure of an oil/water emulsion.

As a second example of interfacial modifiers, we will consider non-amphiphilic particles which adsorb at the interface between two polymers. Once again, analogous to research in oil/water systems, such particles can stabilize polymer blends and foams. Furthermore, a single particle can sometimes adsorb on two interfaces with dramatic rheological consequences, e.g. as little as 0.2 wt.% particles can confer weak gel-like behavior on a blend.

In summary, even small amounts of interfacial modifiers, combined with a suitable processing history, can effect large changes in the morphology of polymer blends.

**THURSDAY, SEPTEMBER 13, 2007**  
**COOKIES AND COFFEE -- 2:30 P.M.**  
**SEMINAR -- 2:45 P.M.**  
**SARKEYS ENERGY CENTER, ROOM M-204**

THIS IS A REQUIRED SEMINAR FOR CHE 5971