SURFACE MODIFICATION OF BIOMEDICAL POLYMERS BY SURFACE-ACTIVE MULTIPOLYMER ADDITIVES: COMPARISON OF FOUR DIFFERENT SURFACE ANALYTICAL METHODS. R.S. Ward, K.A. White and J.S. Riffle, MERCOR Incorporated, Berkeley, CA 94710. Independent control of the bulk and surface properties of biomedical polymers can facilitate the development of new materials and provide the means for systematic study of blood/materials interactions (BMI). We have developed a family of surface-active multipolymers with block and/or segmented architecture to use in minor amounts as surface modifiers of several thermoplastic base polymers. During processing the multipolymer, known as MERonsil™, is homogeneously distributed throughout the melt or solution. During and after surface formation the multipolymer diffuses to the surface of the formed article reducing interfacial energy in the process. In developing an analytical model to predict surface composition of multipolymer-containing blends we have used the simplifying assumption that prior to monolayer coverage all multipolymer resides in the surface(s) of the formed article. Surface composition then depends on bulk concentration of multipolymer, monolayer thickness and formed article geometry (i.e. surface-to-volume ratio). To test for monolayer coverage by the multipolymer we have used four different surface analytical techniques. With PVC as the base polymer and a silicone-containing multipolymer we see increased silicone and/or decreased chlorine in proportion to the surface sensitivity of the method employed. ESCA showed increasing silicone/decreasing chlorine as take-off angle was reduced. In order of increasing surface sensitivity (and silicone content) the results were: ATR-IR, EDAX, low angle ESCA and Contact Angle. The more surface-sensitive the test the better it predicted the reduced platelet adsorption measured in vivo. BMI apparently depend on the outer monolayer of the blood-contacting surface. "Surface" analytical techniques which register an integrated response to bulk and surface composition are less useful than those which approach monolayer sensitivity in the information they provide.