Applications and Properties of Novel Materials Processed from Ultrafine Polymer Particulates

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New polymer milling technology has led to the commercial availability of finely ground polymer powders. Research in the Polymer Center is focusing on new coating and composite materials prepared from these powders with the expectation that bulk materials of enhanced properties can be achieved and that novel coatings for the protection of various materials will result from the application and fusion of these powders to metal and ceramic substrates. Coating technology is studied via the spraying and spin-coat application of the polymer powders followed by fusion to uniform, pinhole-free protective coatings. Current effort is aimed at developing a strong-adhering coating for the protection of ferrous metals although additional effort is focused on biomedical materials. Polymer blends and composites are prepared by dispersive homogenization of the particulate blend mixtures in a suitable vehicle prior to fabrication and fusion of films and bulk samples. Characterization includes mechanical, image, and optical/electro/magnetic as appropriate for the specific films and composites. Results will be reported soon and are expected to lead to commercialization of these powders in moderate to high value products.