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Combustion of Micropowdered Biomass ETHAN GEIL, ROBERT THORNE, Cornell University — Combustion of finely powdered biomass has the potential to replace heating oil, which accounts for a significant fraction of US oil consumption, in heating, cooling and local power generation applications. When ground to 30-150 micron powders and dispersed in air, wood and other biomass can undergo deflagrating combustion, as occurs with gaseous and dispersed liquid fuels. Combustion is very nearly complete, and in contrast to sugar/starch or cellulose-derived ethanol, nearly all of the available plant mass is converted to usable energy so the economics are much more promising. We are exploring the fundamental combustion science of biomass powders in this size range. In particular, we are examining how powder size, powder composition (including the fraction of volatile organics) and other parameters affect the combustion regime and the combustion products.

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