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Effect of Aluminum Particle Surface Area and Morphology on the Combustion Properties of KClO_4/Al Compositions STANLEY CAULDER, JOSEPH MACKEY, JOHN WILKINSON, Indian Head Division, NSWC — Compositions of KClO_4/Al are used in military applications as well as the pyrotechnics industry. The reaction rate as well as the ease of initiation depends on metal particle surface area as well as particle morphology. This factor is especially important for metal fuels having a melting point higher than the melting point of the oxidizer component in the energetic composition. Aluminum powder and turnings of various particle sizes were combined with KClO_4 to form an energetic composition. The explosives mixtures were combusted in a rapid scanning calorimeter device (RSD). dP/dt and dT/dt results were measured and heats of reaction were calculated. The effect of Al particle surface area and particle morphology on the combustion properties of KClO_4/Al is discussed.

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