473c Analysis of the Fundamentals of Co-Extrusion Process for Co-Extrusion of Fast/Slow Burn Composite Grains

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An analytical mathematical model of the co-extrusion flows of viscoplastic fluids in simple channels was developed, followed by experimental validation of the modeling results. The basic experimental system involved the ram extrusion of two viscoplastic suspensions (simulants) through a rectangular slit die. Both suspensions exhibited wall slip subject to their own wall slip coefficients. The interface location between the two suspensions was determined to change if the shear viscosity material functions of the two suspensions differed significantly. Under conditions that generated a stable material interface the velocity and pressure distributions were found to agree well with the results predicted by the mathematical model of the process. The presentation will address the challenges associated with the co-extrusion of energetic grains under stable conditions.