

Abstract Submitted
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**Radial Combustion Dynamics in Fe₂O₃/Al Thermite Mixtures:
Variability of the Flame Propagation Profiles** LUISA DURAES, Dept. Chem.
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Coimbra, Portugal — Radial combustion in thin circular samples of stoichiometric
and over aluminized Fe₂O₃/Al mixtures is studied. Two confinement materials are
tested: stainless steel and PVC. The combustion front profiles are registered by
digital video-crono-photography. The radial geometry allows an easy detection of
sample heterogeneities, since they cause distortions on the combustion front profiles
circularity. The influence of the mixtures Al content and type of confinement on the
combustion propagation dynamics is analyzed. In addition, an asymmetry analysis
of the combustion front profiles is performed, defining an asymmetry parameter and
using ANOVA. Although the type of confinement contributes more than the mixture
composition to the variability of the asymmetry parameter, they both have a weak
influence. The main source of variability is the intrinsic variations of the samples,
which are due to their heterogeneous character.

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