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Heavy metals content in ash from the 2025 Eaton Fire

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The 2025 Eaton fire (Atladena, CA) was an unusual fire at the Wildland-Urban Interface because >90% of the homes incinerated were built pre-1978. These homes were thus likely to contain significant amounts of hazardous constructions materials like lead-paint and asbestos, which have since been banned by the Environmental Protection Agency (EPA) for their danger to human health. Real-time measurements of fine aerosol 14 miles south of the fire zone confirm that high amounts of lead (up to 500 ng/m^3) were released as the fire swept through Altadena. The release of such toxic materials as vapors, fine particles, and ashes raises significant public health concerns. For the Eaton fire, these risks are further heightened by the potential for efficient transport over large distances enabled by the extreme winds that fanned the fire. How much lead and heavy metals were indeed present in the fire zone? How far were they transported by the intense winds?

Here, we report on the elemental composition of Eaton fire ash samples and assess the extent of mobilization and transport of the contaminants released by fire. Specifically, we measured by Q-ICPMS the concentrations of major and trace elements in 47 ash samples and 3 soil samples from the Eaton Fire. These sample were collected in the initial 4 weeks after the fire devastated Altadena, in areas ranging from deep within the burn site to neighborhoods miles away. This approach both minimized post-fire modification of the ashes (*e.g.*, by rain) and ensured that variations in the ashes compositions over a broad area, if present, could be documented. At the conference, we will report on the spatial distribution of lead and heavy metals in the ashes from the Eaton Fire, and discuss the implications both from a material transport perspective, as well as a public health and regulatory perspective.