

OPTICAL MICROSCOPY RESULTS ON DUSTS

Tingting Cao has also performed an experiment in which the soil dusts tested were observed under a microscope. As observed in the figure below, dark colored inclusions in/on the dust were frequently observed.

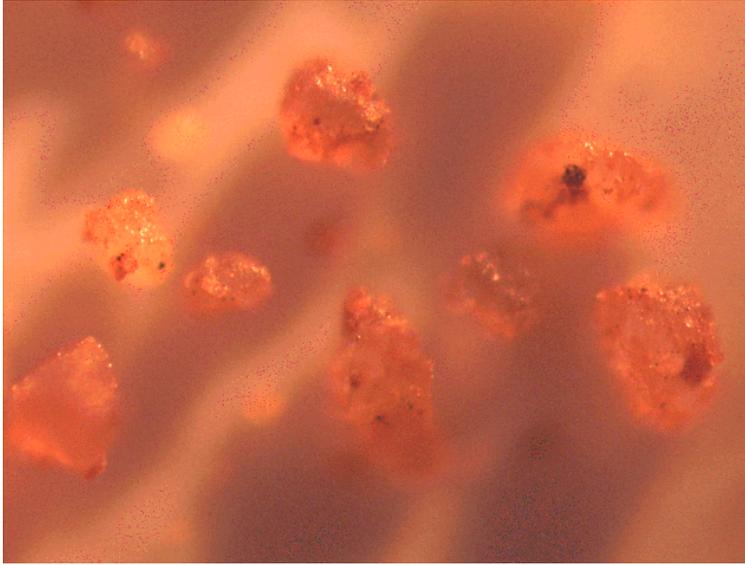


Figure 1. Unheated Amarillo Soil dust. Note black inclusions present in or on most particles. We speculate such inclusions may be carbonaceous in origin (e.g. BC or Char).

Then, the soil dusts were strongly heated in a crucible with a Bunsen burner.

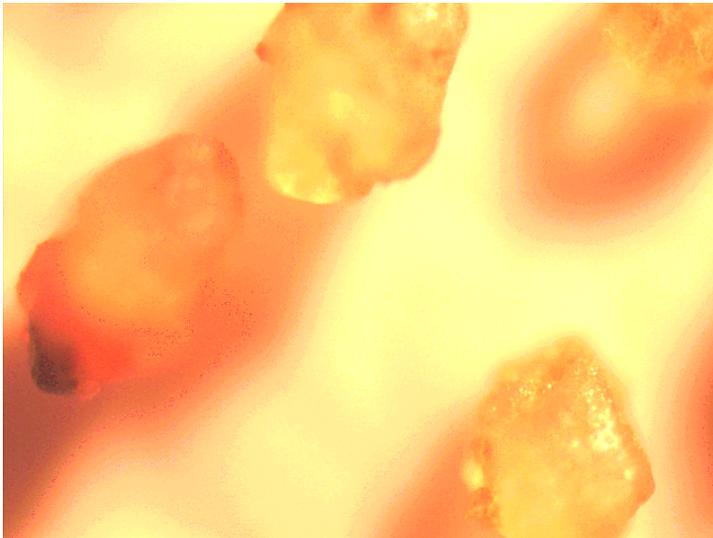


Figure 2. Amarillo Soil dust after heating in a Bunsen burner / crucible. Note, the black inclusions appear to be less frequent after heating.

Tingting then performed an experiment in which she visually inspected 121- 132 individual soil particles for two different soil types used in the study (Amarillo and Pullman). She found the percentage of particles that contained dark colored inclusions. Results were 82.8-93.4% of particles for Amarillo and Pullman sample had inclusions for unheated soil.

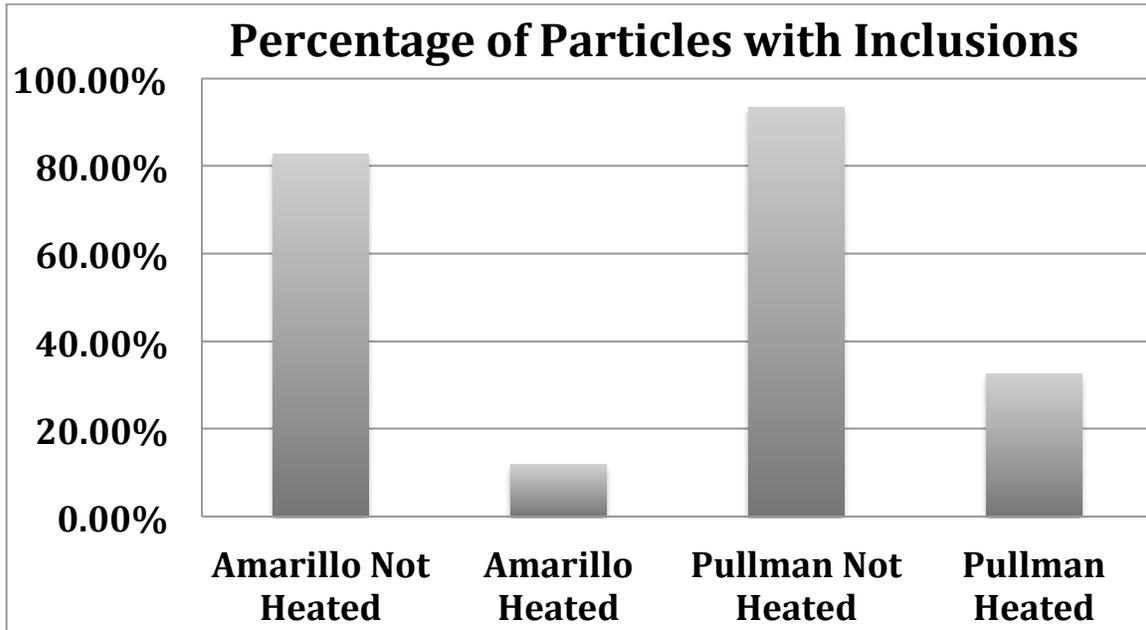


Figure 3. Quantitative results comparing the fraction of particles containing dark colored inclusions before and after heating.

Then, both soil samples were heated strongly in a Bunsen burner flame and the visual inspection process repeated. After heating, the percentage of particles that had dark inclusions fell to approx. 12 and 36% for the Amarillo and Pullman samples. The frequency with which dark inclusions were observed seems to have been reduced significantly by heating.

Given the dark color of the inclusions, we would expect them to absorb light strongly and possibly contribute to incandescence.