

Electrical properties of Itokawa grains returned by the Hayabusa mission

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Abstract: We have measured the response of selected areas of RA-QD02-0126-02 and RB-QD04-0072 to incident electronic beams in the range 100eV to 5keV in an attempt to determine secondary emission characteristics as a function of surface structure, orientation and mineralogy. Such characteristics are compared to similar measurements made on reference materials of high purity in the same test set-up, as well as terrestrial Fosterite grains. In addition the 3D grain morphology was studied from SEM based stereo-mesurements, linking grain surface area and electrical capacitance. Those tests follow a significant improvement of our measurement set-up to achieve the required sensitivity and reproductibility, with a major effort to limit water adsorption and mitigate charging while dealing with a non conductive mineral matrix. Consequences on our understanding of electrostatic effects on planetary regolith will be discussed.

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