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Plausible asteroidal analogs for enstatite chondrites and mesosiderites

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We present new irradiation experiments performed on the enstatite chondrite Eagle (EL6) and the mesosiderite Vaca Muerta. These experiments were performed with the aims of (a) quantifying the spectral effect of the solar wind on their parent asteroid surfaces and (b) identifying their parent bodies within the asteroid belt. For Vaca Muerta we observe a reddening and darkening of the reflectance spectrum with progressive irradiation, consistent with what is observed in the cases of silicates and silicate-rich meteorites such as OCs and HEDs. For Eagle we observe little spectral variation, and therefore we do not expect to observe a significant spectral difference between EC meteorites and their parent bodies. We evaluated possible parent bodies for both meteorites by comparing their VNIR spectra (before and after irradiation) with those of $\tilde{4}00$ main-belt asteroids. We found that 21 Lutetia (Rosetta's forthcoming fly-by target) and 97 Klotho have physical properties compatible with those of enstatite chondrite meteorites while 201 Penelope, 250 Bettina and 337 Devosa are compatible with the properties of mesosiderites.