Ocean acidification during the Deccan Phase-2

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Abstract: Environmental changes linked to Deccan volcanism are still poorly known. A major limitation resides in the paucity of direct Deccan volcanism markers and in the geologically short interval where both impact and volcanism occurred, making it hard to evaluate their contributions to the mass extinction. We investigated the low magnetic susceptibility interval just below the Iridium-rich layer of the Bidart (France) and Bidart (Italy) section, which was recently hypothesized to be the result of palaeoenvironmental perturbations linked to paroxysmal Deccan phase-2 (Font *et al.* 2011, 2014). Results show a drastic decrease of detrital magnetite and biomagnetite and presence of scarce akaganeite, a hypothesized reaction product formed in the aerosols derived from reaction of the volcanic plume with water and oxygen in the high atmosphere. The association of specular akaganeite and iron dissolution are discussed by evocating ocean acidification and aerosol deposition linked to the Deccan Phase-2. These results highlight the nature and importance of the Deccan-related environmental changes leading up to the end-Cretaceous mass extinction.

Keywords: Deccan volcanism, akaganeite, ocean acidification, mass extinction, environmental magnetism

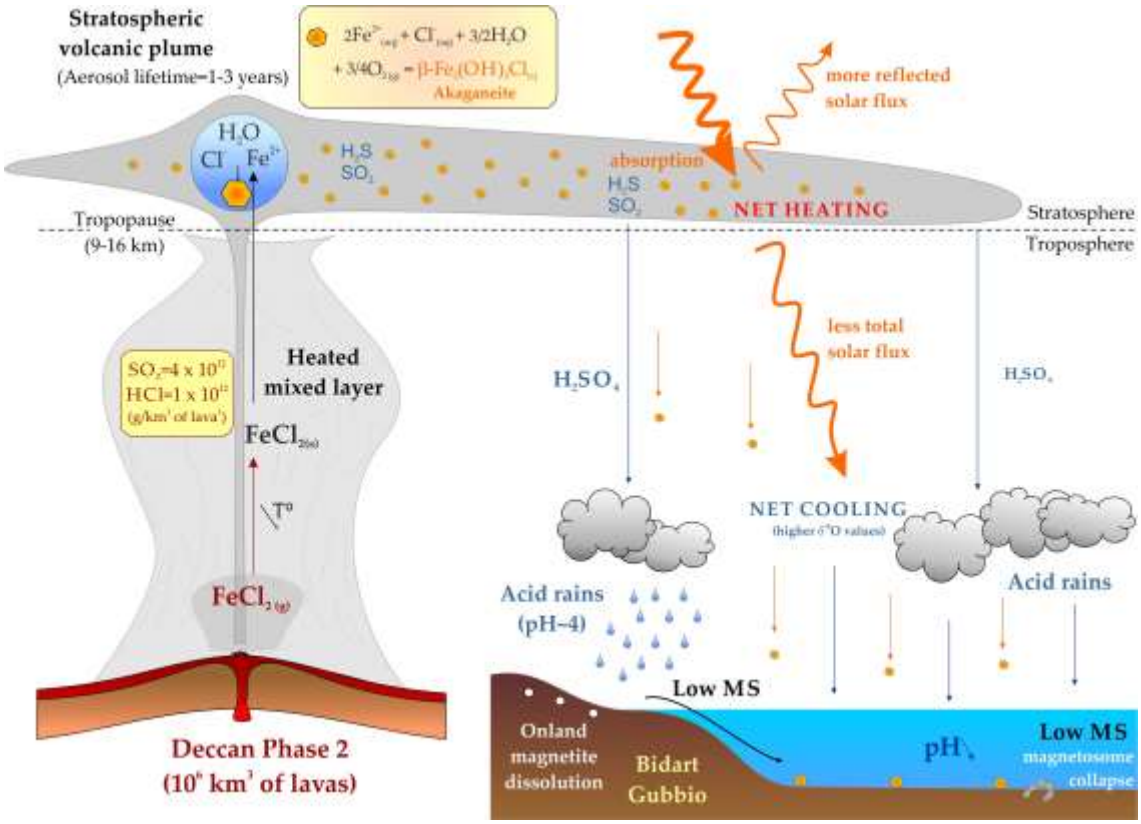

Figure 1. Magnetic data (magnetic susceptibility and Isothermal Remanent Magnetization parameters) of the Bidart section (modified from Font et al. (2014)). Log B1/2 (mT) is the mean coercivity of each magnetic component. SIRM corresponds to IRM values at saturation. Component 1 and 2 correspond to detrital and biogenic magnetite, respectively, whereas component 3 is probably hematite. The low MS interval is featured by a loss in detrital and biogenic magnetite.

References :

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