Exercise 4 Iridium from the Deccan Basalts? (Chapter 11 of *The Cretaceous World*)

You should allow about ½ hour to complete this Exercise. You will need a calculator, paper and pencil, and The Cretaceous World.

Question 4.1 A substantial part of the debate on the K/T impact hypothesis during the mid-late 1980s focused on whether the observations being made on the K/T boundary clay could be explained by some other, non-extraterrestrial, process. Top of the list was the Deccan flood basalts (see Section 7.3 of *The Cretaceous World*). The total volume of the Deccan Traps is around 1×10^6 km^3 (1×10^{15} m^3). The most likely mechanism by which Ir in the Deccan could end up distributed globally is from the degassing of the basalts as they erupted. Studies of the Kilauea volcano in Hawaii suggest around 0.3% of the Ir in a basalt could be degassed in this way, the basalts at Kilauea have an Ir content of 0.32 ppb. Assuming the Deccan basalts degassed in a similar manner to those at Kilauea and contained the same amount of Ir, could the Deccan Traps produce the 1.5×10^8kg of Ir that have been calculated to have been distributed globally at the K/T boundary? Basalt has a density of 3050 kgm^{-3}.

The answer you obtain will, in fact, be too high since only around 50% of the Deccan Traps were erupted prior to the K/T boundary and the Ir content of Deccan basalts is much lower than the Kilauea lavas, at around 0.0062 ppb.