Pd-Ag evidence for rapid cooling of iron meteorite parent bodies.

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The short-lived ^{107}Pd-^{107}Ag system is ideally suited to investigate the accretion and cooling histories of iron meteorite parent bodies. We present internal Pd-Ag isochrons for several IIIAB iron meteorites, covering almost the entire crystallization sequence of the IIIAB core. The effects of neutron capture and spallation on Ag isotopes were corrected using an empirical model and Pt isotopes as a neutron fluence monitor. All IIIAB irons investigated so far—including early and late crystallized samples—have indistinguishable Pd-Ag ages, indicating rapid cooling of the IIIAB metal core within less than ~1 Ma. The Pd-Ag ages of the IIIAB irons are indistinguishable from those of IVA iron meteorites (Gibeon and Muonionalusta), indicating that both the IIIAB and IVA cores cooled below Pd-Ag closure at about the same time. Such rapid and contemporaneous cooling of iron meteorite parent bodies may reflect the removal of an insulating silicate mantle from both bodies during a brief period of intense collisions between protoplanetary bodies early in solar system history.