Date them all: Re-Os ages for Upper Jurassic-Lower Cretaceous shales, ammonite zones and chronns

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Numerical ages of Upper Jurassic and Lower Cretaceous stages are derived mostly from correlation of magnetostatigraphic patterns of Sub-Boreal and Tethyan ammonite zones to the M-sequence marine magnetic anomalies, coupled with constraints from cycle stratigraphy [1]. The ages for Late Jurassic polarity chrons, however, are ultimately based on a model for gradually increasing Pacific spreading rates from ~170 Ma to ~125 Ma that has only a few age constraints [1]. This sequence of correlations with little radiometric age control is further complicated by the extreme faunal provincialism during the late Jurassic.

Here we present Re-Os ages for organic-rich shale from the Upper Jurassic-Lower Cretaceous Hekkingen Formation in the Norwegian Arctic. Three intervals with detailed Boreal scale for Upper Jurassic-Lower Cretaceous stages are derived mostly from correlation of magneto-stratigraphic patterns of Sub-Boreal and Tethyan ammonite zones to the M-sequence marine magnetic anomalies, coupled with constraints from cycle stratigraphy [1]. The ages for Late Jurassic polarity chrons, however, are ultimately based on a model for gradually increasing Pacific spreading rates from ~170 Ma to ~125 Ma that has only a few age constraints [1]. This sequence of correlations with little radiometric age control is further complicated by the extreme faunal provincialism during the late Jurassic.

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