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# Sulphur isotopes in Permian–Triassic evaporites: an 80□million□year record of pyrite burial

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The Permian–Triassic time interval is associated with major perturbations in the biogeochemical cycling of several redox-sensitive elements. In particular, sulphur isotope ratios ($\delta^{34}S$) reveal substantial perturbations in sedimentary sulphates. Despite this, few studies utilise this $\delta^{34}S$ variability for long-term high-resolution correlation. Through the sulphur isotope analysis of sedimentary evaporites of the Staithes S-20 borehole (northeast England), we have generated the most stratigraphically complete evaporite sulphur isotope ($\delta^{34}S_{evap}$) curve from a single stratigraphic section for the late Permian to Late Triassic. The Staithes S-20 record and its comparison with the global $\delta^{34}S_{evap}$ curve demonstrate the utility of sulphur isotope data for stratigraphic correlation and dating, especially evaporite bearing sequences. The $\delta^{34}S_{evap}$ data for the late Permian to Late Triassic were incorporated into a biogeochemical box model to yield estimates for the pyrite burial flux with time. We propose three significant pyrite burial events (i.e. PBEs) throughout the Triassic. Our model outputs predict a major increase in pyrite burial over the Permian/Triassic boundary, possibly driven by Siberian Traps volcanism. After ~10 million years, the pyrite burial flux achieves relative stability until the latest Triassic.