

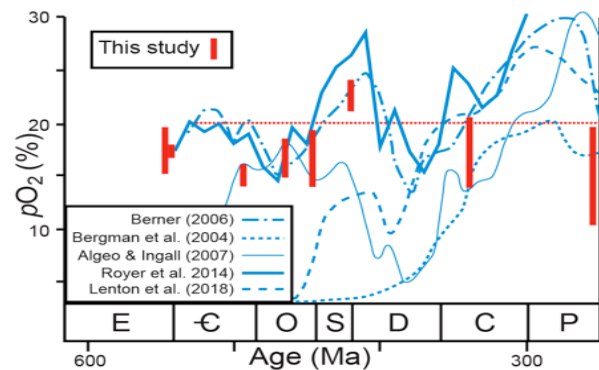
Atmospheric oxygen of the Paleozoic

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The Earth's atmospheric oxygen content is normally derived from a set of proxies such as carbon isotopes and others, and by subsequent modeling (e.g., Berner, 2009). Many proxy-based oxygen content models have been reconstructed and presented for the Paleozoic. Here, we present measurements of atmospheric oxygen trapped in fluid inclusions of halite extensively screened for primary signatures. Screening consisted of a multitude of steps including texture and fabric, geochemistry, including Br and Sr, and microthermometry of gas bubbles (Blamey & Brand, 2019). Halite consistent with screening came from the Ediacaran of Pakistan and China, Cambrian of Oman, Ordovician of China and Canada, Silurian of Canada, Carboniferous of Canada and the Permian of the U.S.A. Measured atmospheric oxygen during the late Ediacaran ranged from 16.6 to 17.5 % (14.7 – 19.5), in the Cambrian with 15.0 % (14.8 – 15.2), in the mid Ordovician with 16.7 % (15.2 – 18.2), in the late Ordovician with 16.2 % (13.7 – 18.7), in the late Silurian with 22 % (21 – 24), in the Carboniferous from 15.0 to 17.3 % (14.1 – 20.7), and in the Permian with 14.3 % (10.2 – 19.3). Measured atmospheric oxygen contents are consistent with the general model except during the Ediacaran-Cambrian-Ordovician and the late Permian (Figure 1). Overall, the oxygen measurements are consistent with extinctions and radiations of life during the late Neoproterozoic and Paleozoic (Blamey et al., 2016).



Berner, R.A., 2009. *Am. Jour. Sci.*, 309, 603-606.

Blamey, N.J.F. & Brand, U., 2019. Atmospheric gas in modern and ancient halite fluid inclusions: a screening protocol. *Gondwana Research* 69, 163-176.

Blamey, N.J.F., Brand, U. et al., 2016. Paradigm shift in determining Neoproterozoic atmospheric oxygen. *Geology* 44, 651-654.

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