

Retraction: Carbon enters silica forming a cristobalite-type CO₂-SiO₂ solid solution

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Nature Communications 5:3761 doi:10.1038/ncomms4761 (2014); Published 30 Apr 2014; Updated 29 Nov 2016

In this Article, we reported the synthesis of a crystalline CO₂-SiO₂ solid solution by reacting carbon dioxide and silica in a laser-heated diamond anvil cell at pressures between 16 and 22 GPa and temperatures greater than 4,000 K, and showed that carbon enters silica. We have now reanalysed all our X-ray diffraction patterns, in particular those at room pressure where potential volatile components (for example, CO₂) are absent, making data interpretation as simple and clean as possible¹. Indeed, we find that orthorhombic β-ReO₂ (Pbcn) provides a better fit to the temperature-quenched new phase than tetragonal cristobalite. This possibility was also indicated by experimental results from Santamaria-Perez and co-workers². Hence what we previously interpreted as a CO₂-SiO₂ solid solution now appears to be ReO₂, indicating the decomposition of CO₂ leading to the oxidation of Re from the gasket, which is found to diffuse into the sample in the laser heating experiment. The authors therefore wish to retract this Article.

References

1. Santoro, M. *et al.* Correspondence: Reply to 'Strongly-driven Re + CO₂ redox reaction at high-pressure and high-temperature'. *Nat. Commun.* 7, 13538 (2016).
2. Santamaria-Perez, D. *et al.* Correspondence: Strongly-driven Re + CO₂ redox reaction at high-pressure and high-temperature. *Nat. Commun.* 7, 13647 (2016).



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