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# Perchlorate glasses on Mars and the search for extraterrestrial life

Philippe Reekie\*<sup>†1</sup> and Charles Cockell<sup>1</sup>

<sup>1</sup>University of Edinburgh – United Kingdom

## Abstract

Evidence suggests that perchlorate salts are abundant on Mars. Salts have astrobiological importance, because they can entomb and preserve biomatter for hundreds of millions of years. However, perchlorate salts are highly oxidizing and can corrode organics and so unlike more biocompatible salts like NaCl, perchlorates have been disregarded as potential preservation shelters for biomatter. Curiously, perchlorate solutions vitrify rather than crystallise at  $\leq -120^{\circ}\text{C}$ , and so perchlorate glasses may exist at extremely cold locations such as the Martian poles. A vitrifying medium may entomb extraterrestrial cells and biomolecules more effectively than a crystallising medium. Exploring and testing extremely cold perchlorate glasses as a means for biological preservation is the focus of my PhD project. Keywords: Mars, Astrobiology, Perchlorates

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\*Speaker

<sup>†</sup>Corresponding author: Philippe.Reekie@ed.ac.uk