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Showcasing research from Professor Claire Villevieille, LEPMI, UGA Grenoble, France and Professor Hubert Girault, ISIC, EPFL Lausanne, Switzerland.

Redox aspects of lithium-ion batteries. Is graphite an anode?

This paper examines the potential-dependent intercalation steps of lithium cations into graphite from an electrochemical perspective. In the absence of redox reactions, it is argued that a graphite negative electrode cannot strictly be classified as an anode. The message (in the bottle...) behind this picture is that graphite is not an electrode where electrochemical reactions take place, but a volumic capacitor called here a capacitive rack, where ions are stored like wine bottles in a wine rack. It illustrates that a lithium battery with a graphite electrode is a mixed redox/capacitor energy storage device, with electrochemical reactions at the positive electrode and electrostatic charging at the negative electrode.

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As featured in:



See Hubert Girault *et al.*,  
*EES Batteries*, 2026, **2**, 103.