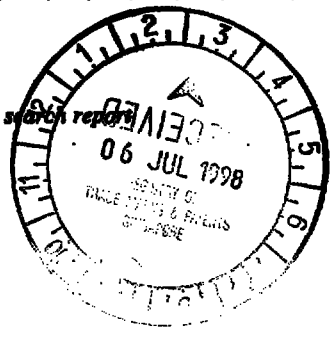


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(54) Title: APPARATUS AND METHOD FOR IN SITU X-RAY STUDY OF ELECTROCHEMICAL CELLS

(57) Abstract

An apparatus and method for monitoring structural changes of an electrode in a rechargeable battery include an *in situ* x-ray electrochemical cell (30) comprising top and bottom cell members (32, 34) including at least one beryllium window element (36) for transmission of diffractometer x-radiation. A rechargeable battery (43) mounted within the x-ray cell enclosure comprises an electrolyte/separator element (68) interposed between positive and negative electrodes (64, 66). A current collector element (70) formed of an electrically-conductive open-mesh grid is disposed between the positive electrode and the separator to enable ion-conducting contact of the electrode and separator while maintaining electrical continuity between the electrode and an external x-ray cell terminal (54). As a result of this arrangement, the positive electrode need not contact the window element to establish an electrical battery circuit, but may be sufficiently spaced from the window to avoid electrolytic corrosion of the beryllium element. The *in situ* x-ray electrochemical cell and battery structure allow for continuous monitoring of the structural changes in electrode materials during charge/discharge cycling.

No covering letter

