

ABSTRACT

A zinc-vanadium battery includes a modified positive electrode structure (including a positive electrode and a modified layer), a separator, a negative electrode, and an aqueous electrolyte. The modified layer on the positive electrode includes 70-95 parts by weight of vanadium-based material, 3-45 parts by weight of a conductive agent, and 3-45 parts by weight of a binder. The separator is on the modified layer, and the negative electrode is on the separator. The positive electrode, the modified layer, the separator, and the negative electrode are in the aqueous electrolyte. In the X-ray diffraction patterns of the vanadium-based material measured by XRD using $\text{CuK}\alpha 1$ ray, an intensity ratio of a peak at $2\theta=8^\circ\pm 1.0^\circ$ over a peak at $2\theta=20^\circ\pm 1.0^\circ$ (denoted as I_8 and I_{20} , respectively) satisfies $0 < I_8/I_{20} \leq 1.4$. Furthermore, the modified positive electrode structure, a method of manufacturing the modified positive electrode structure, and a method of manufacturing the zinc-vanadium battery are provided.

FIG. 1