High Performance Printable Energy Storage Devices

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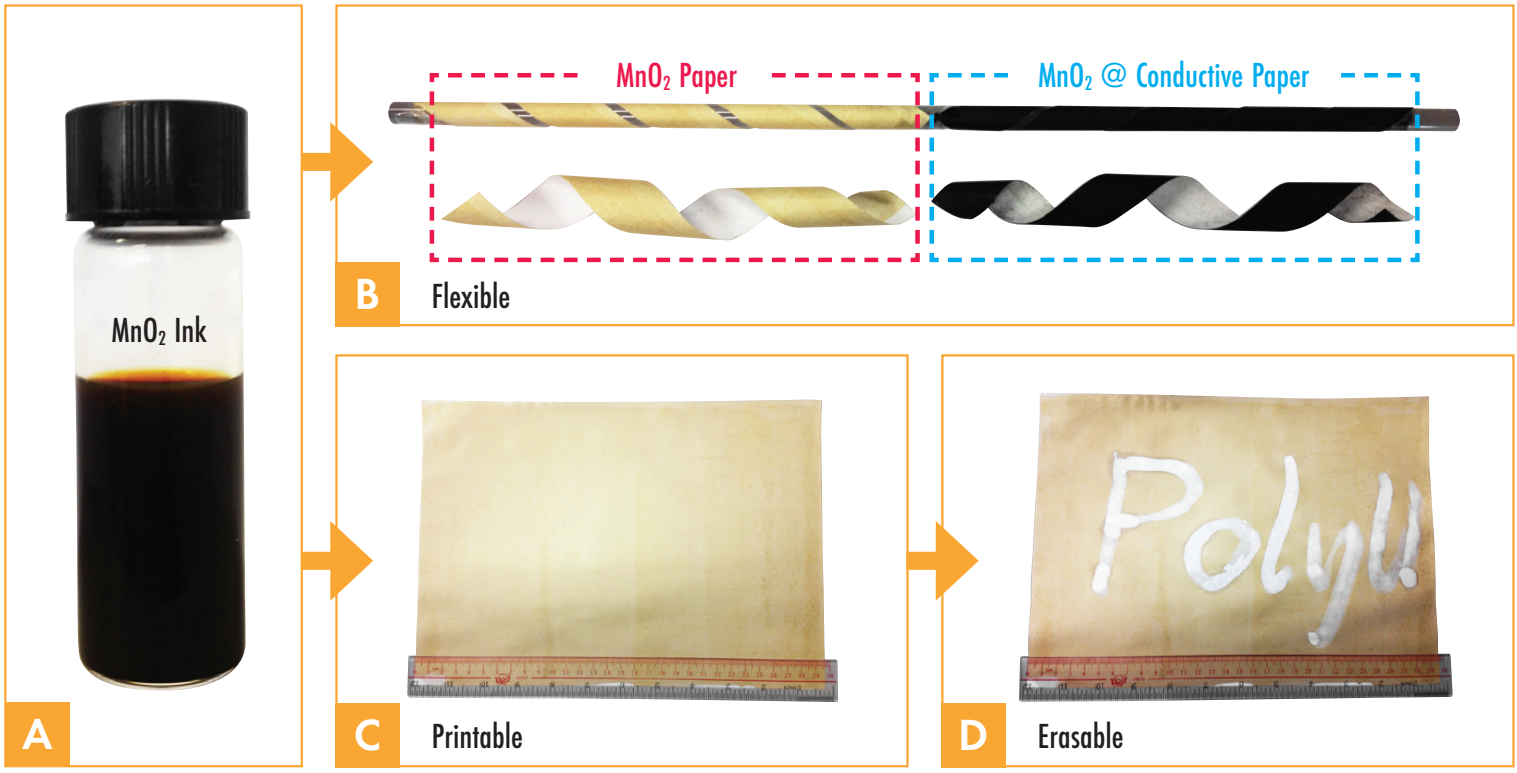

The conventional MnO_2 electrodes are mainly prepared by two approaches: 1) nanostructured MnO_2 or MnO_2-containing composite precipitates via wet chemical process; 2) direct electrodeposition or chemical deposition on various substrates (e.g. glass, quartz, copper or aluminum foil). These existing preparation methods suffer from higher cost, complicated processes and superfluous contaminations. On the other hand, during the coating process, the introduction of insulating binders would cause agglomeration in the inks, leading to the reduction of electrical conductivity.

By now, it still remains a great challenge to synthesize MnO_2 inks with high reliability and versatility. Hence, the development of environmental-benign aqueous MnO_2 inks is desirable for high-efficient and large-scale printable processes.

Performance tests of inorganic MnO_2 ink. (A) Optical picture of the MnO_2 ink. (B) MnO_2 ink coated flexible paper strips with (right) and without (left) MCNTs treatment. (C) A sheet of A4-sized paper coated by the MnO_2 ink. (D) The MnO_2 coated paper shown in C erased by oxalic acid with the erased area showing the word "PolyU".

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