

## ABSTRACT

The eggshell membrane, which is located on the inner surface of the eggshell, is one of the valuable and useful wastes, especially as a battery separator. Polyaniline|Zn batteries are polymer-based batteries that have been widely developed today. This study aims to use eggshell membranes as an electrolyte medium in Polyaniline|Zn batteries. Polyaniline was synthesized on the surface of a glass slide that had been coated with a graphite sticker using the electrodeposition method. This process uses a current source from a battery with a voltage of 3 V. Characterization of the synthesized product was carried out by measuring the FTIR spectrum. Battery fabrication is made in the form of a sandwich, namely polyaniline as cathode while Zn as anode. Furthermore, the measurement of battery performance using a multimeter. The synthesized polyaniline is in the form of a dark green precipitate. The measurement of the FT-UR spectrum showed important absorptions in the 1302 cm<sup>-1</sup> and 1246 cm<sup>-1</sup> regions which were the stretching vibrations of C–N and (C–N<sup>+</sup>•) on the polaron lattice so that the synthesized product was in the Emeraldine Salt state. Polyaniline|Zn batteries with 1 M ZnCl<sub>2</sub> electrolyte showed the best initial performance at 10 minutes of immersion, namely a voltage of 1.20 V and a current of 0.006 A. Four Polyaniline|Zn Batteries with a series arrangement of 4 (electrode contact area 2 x 2.5 cm) could turn on the red, white, green, and blue LEDs. Therefore, the eggshell membrane can be used as an electrolyte membrane in Polyaniline|Zn batteries.

Keywords: battery, egg shell, electrolyte, membrane, polyaniline