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GREEN HYDROGEN GENERATION FROM WATER USING DRY CELL ELECTROLYSIS WITH VARIOUS CATALYSTS

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Abstract

Production of Oxy-hydrogen (HHO) in an efficient and environmentally friendly manner is a great challenge using water electrolysis. In the present study, experimental investigations on the HHO yield from dry-cell electrolysis was carried out by varying various catalyst (KOH, $Ba(OH)_2$, NaOH, $Mg(OH)_2$ and $Ca(OH)_2$) and its concentration (10 – 50 g), applied current (1 – 4 A) and plate's quality (26 – 32). Results showed an increase in HHO yield and H_2 production efficiency with increments in the concentration of KOH, $Ba(OH)_2$, and NaOH, while those were declined for $Mg(OH)_2$ and $Ca(OH)_2$. Among the catalyst, 50 g of KOH in an electrolyte performed superior with an HHO yield of 0.6 lpm and production efficiency of 53.7%. Followed by the HHO generator performance was optimised by modifying the applied current and plate quantity. The peak H_2 production efficiency (60.8%) and HHO yield (0.68 lpm) were achieved with 30 plates at 4 A and 12 V of input power.

Key words: catalysts; dry cell electrolysis; green energy; hydrogen generation; production efficiency

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