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**Investigation and characterization of calcium oxide from waste eggshells as a desiccant materials**

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**Abstract**

The purpose of the study was to develop the calcium oxide (CaO) from chicken and duck eggshells as a humidity adsorbent. The CaO powder was prepared from the calcined eggshells at 1300°C for 4h. The samples were characterized by X-ray diffraction (XRD), Fourier transform infrared analysis (FTIR) and scanning electron microscope (SEM). From the results, the hydration rate of CaO from chicken and duck eggshell was 0.1805 and 0.2406%RH·min<sup>-1</sup>, respectively. Moreover, the hydration rate of sample decreased with increasing the cycle of repeatability testing. The CaO phase from both eggshells partly transformed into portlandite phase of calcium hydroxide (Ca(OH)<sub>2</sub>) after the humidity adsorption testing which confirmed by XRD result. Furthermore, the CaO from duck eggshells absorbed the humidity faster than chicken eggshells. In this study suggested that the CaO powder from the both waste eggshells could be used as an alternative humidity adsorbent for the commercial and industries.

**Keywords:** Adsorbent, Calcium oxide, Eggshells, Hydration rate, Moisture