

Study thermal resistance of γ -Al₂O₃ at various reaction temperatures via TGA analysis

*Aiman A. Bin Mokaizh**, *Abdurahman Hamid Nour*, *Oluwaseun Ruth Alara*, *M. Abdulqawi*
Faculty of Chemical and Process Engineering Technology, Universiti Malaysia Pahang,
Gambang, Pahang, 26300, Malaysia

ABSTRACT

The discarded empty aluminium beverage cans can pose a serious environmental contamination issue. Recently, studies are now focusing on reducing and utilising solid wastes which have grown to be a significant environmental concern. Thus, this study focuses on producing γ -Al₂O₃ from readily available aluminium garbage cans using a Sol-gel technique and analysing its thermal properties using TGA analysis. The effect of the reaction temperatures was further investigated to comprehend the synthesis of alumina at (room temperature, 50 °C, and 70 °C) at a fixed aging duration of 12 h. Experimental findings demonstrated the potential of producing γ -Al₂O₃ from used aluminium cans, which may then be used as sustainable catalysts and catalytic supports for a variety of applications. The results showed that all the synthesised alumina had a good result with a maximum weight loss less than 5%; this reflected its strong stability. The alumina that was created at 70 °C reaction temperature recorded the lowest weight loss and the highest residue at 2.78% and 97.22%, respectively.

KEYWORDS

Aluminium Waste Cans; Reaction Temperature; Thermogravimetric Analysis (TGA); γ -Al₂O₃

ACKNOWLEDGEMENT

The authors are grateful to Universiti Malaysia Pahang (UMP) for financial assistance for this study using Industrial grant number, UIC190806.