

THE EFFECTS OF CULLET LEVEL IN THE FORMATION OF P₂O₅ - CaO BASED GLASS.

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ABSTRACT

Factors in determining the right composition of the starting material for cullet-P₂O₅-CaO glass system were studied. The formation of the glass is very much compositional dependence and the best sets for the glass formation was found to be in the range between 60 wt% P₂O₅ + (40 - x) wt% cullet + x wt% CaO where $1 \leq x \leq 5$. The samples are less hygroscopic as the composition of CaO which is acting as a modifier increases. The suitable temperature for glass melting was 1450^oC and the time needed was 5 hours for the mixture to melt completely before it can be quenched. The microstructure of the glass samples were examined by Scanning Electron Microscopy (SEM) and X-Ray Diffraction (XRD). The actual composition of the samples were determined by The Energy Dispersive Analysis by X-ray (EDAX).

<http://journal.masshp.net/wp-content/uploads/Journal/2004/Mazlina%20Mat%20Darus%2013-20.pdf>

REFERENCES

- [1] Northover, J.P. and Groves, G.W. (1981). "High-temperature mechanical Properties of Li₂O-Al₂O₃-SiO₂ (LAS) Glass Ceramic. Part 2." *Journal of Mat. Sci.* **16**. 1881 – 1886.
- [2] J. Hlavac (1982). *The Technology Of glass and ceramic an Introduction*, Elsevier Sc. Pub. Co. New York.
- [3] Liew, A.S(1998). *The effect of cullet on the properties of container glass* , Master of Science Thesis, UTM.
- [4] Holloway, D. G.(1973). "The Physical Properties of Glass." Great Britain: Wykeham Pub. Ltd.
- [5] R. H Doramus (1973). *Glass Science*, John Wiley & Sons, Canada.
- [6] Newton, R.G (1985), "The durability of Glass – A Review" *Glass Technology.* **26** (1).21 – 37.