

## **Artificial neural network prediction on ultrasonic performance of bismuth-tellurite glass compositions?**

### **ABSTRACT**

Artificial neural networks (ANN) is known as one of the artificial intelligence tools which are inspired by the biological nerve system, have a capability to predict the physical and elastic parameter of glasses without melting the raw materials. The experimental of bismuth-tellurite glasses with the composition  $y\text{Bi}_2\text{O}_3 - (1-y)\text{TeO}_2$  where  $y = 0, 0.05, 0.07, 0.10, 0.13, 0.15$  have been fabricated using melting and quenching methods. These works were discovered that the prediction value by artificial neural networks for density, ultrasonic velocity, and elastic moduli of bismuth-tellurite glass composition gives a very good agreement as compared with the experimental measurements. The goodness of fit from the graph used  $R^2$  value to represent the relationship between the data presented from the experiment and prediction model. The great fit of coefficient  $R^2$  value elucidates in all figures is around 0.99942–1.0000 which is considered to be very satisfactory.

**Keyword:** Tellurite glass; Bismuth oxide; Elastic properties; Artificial neural networks