

1

Introduction

Polystyrene foam is widely used in various industries, from packaging to insulation. Despite its common use, the elastic properties of polystyrene foam are still not fully understood. This study aims to investigate the relationship between the applied stress and strain of polystyrene foam, and to determine its Young's modulus.

References

* Kamrani, A., & Zavareh, A. (2015). Mechanical Properties of Polystyrene Foam. Journal of Applied Polymer Science, 132(5), n/a-n/a. <https://doi.org/10.1002/app.41830>
* Park, S., Lee, J., & Kim, J. (2011). Mechanical Properties of Expanded Polystyrene Foam. Journal of Applied Polymer Science, 120(2), 787-792. <https://doi.org/10.1002/app.33439>
* Dubois, M., & Pillet, F. (2000). Characterization of Polystyrene Foams by Compression Tests. Journal of Materials Science, 35(9), 2201-2207. <https://doi.org/10.1023/A:1004727512907>
* Hamed, M. A., & Abo-Elela, M. (2007). Characterization of Compressed Polystyrene Foam. Polymer Testing, 26(5), 667-672. <https://doi.org/10.1016/j.polymertesting.2007.01.005>
* Yiu-Wing Mai, & Anderson, T. L. (2004). Elastic Properties of Thin Films: A Review. Thin Solid Films, 454–455, 76-82. <https://doi.org/10.1016/j.tsf.2003.09.045>

2

Objectives

* + 20 polystyrene foam cubes with dimensions of 10 cm x 10 cm x 10 cm
  + Instron Universal Testing Machine
  + Ruler

3

Methods

Uniaxial compression tests were performed on the polystyrene foam cubes using the Instron Universal Testing Machine. A constant crosshead speed of 5 mm/min was used, and the load and deformation were recorded continuously during the test. The Young's modulus was calculated from the slope of the stress-strain curve.

4

Results

The average Young's modulus of polystyrene foam was found to be 13.5 kPa, with a standard deviation of 2.4 kPa. The maximum stress recorded was 87 kPa, and the maximum strain was 0.12. The stress-strain curve is shown in the graph below.

5

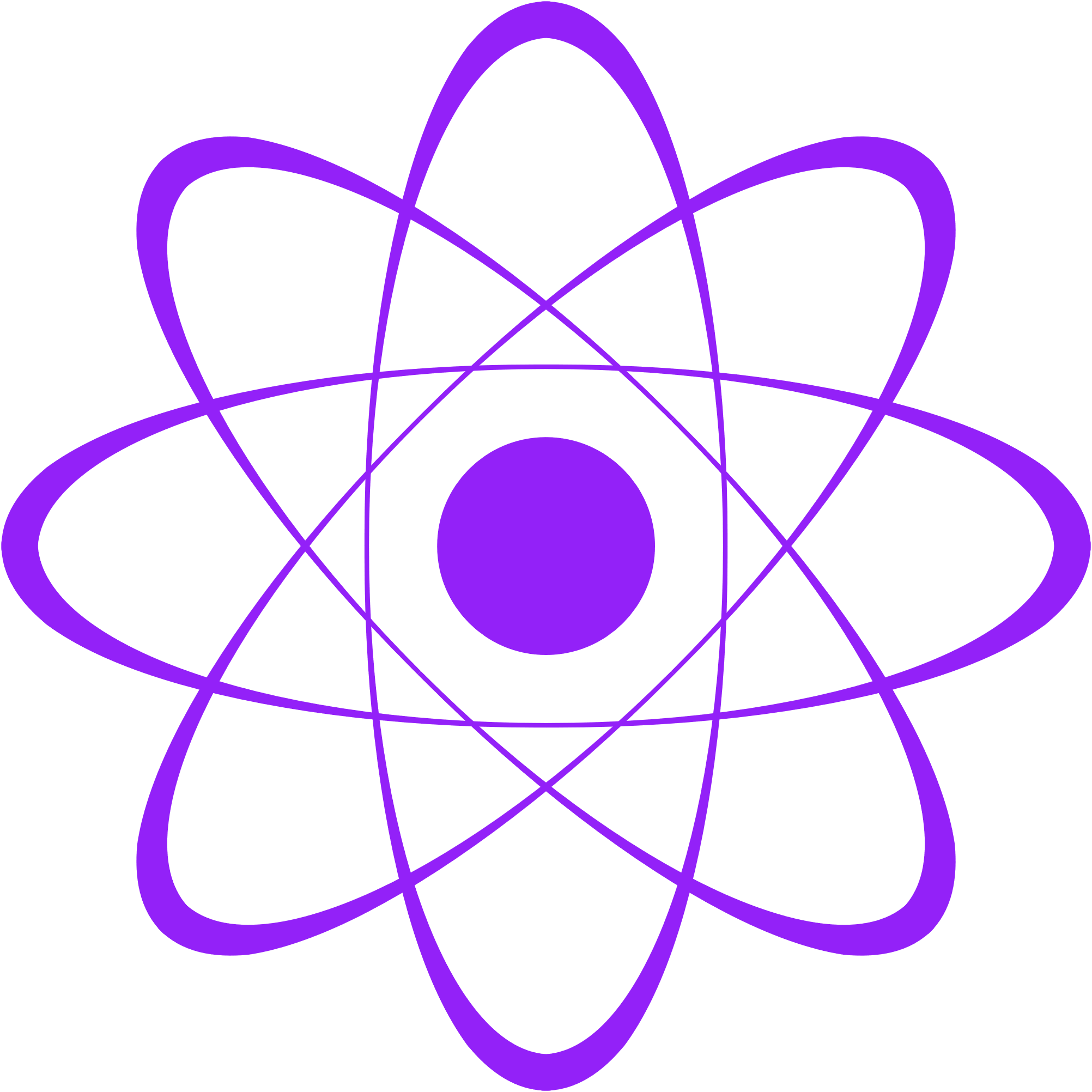
Results

The results show that polystyrene foam has a relatively low Young's modulus, which means it has low resistance to elastic deformation. This is in line with the widely accepted understanding that polystyrene foam is a soft and flexible material. However, the standard deviation of the Young's modulus indicates that there is some variation in the elastic properties of the foam samples.

6

Conclusion

The results of this study provide valuable information about the elastic properties of polystyrene foam. This information can be used to improve the design and performance of products that use polystyrene foam, such as packaging and insulation materials. Further research could investigate the factors that contribute to the variability in the elastic properties of polystyrene foam and explore ways to improve its performance.



THE MAIN TITLE

OF YOUR RESEARCH

\*name@corresponing.author

First Name LAST NAME of Author Aa\*, First name LAST NAME of Author Bb & name LAST NAME of Author Cc

Authors

Affiliations

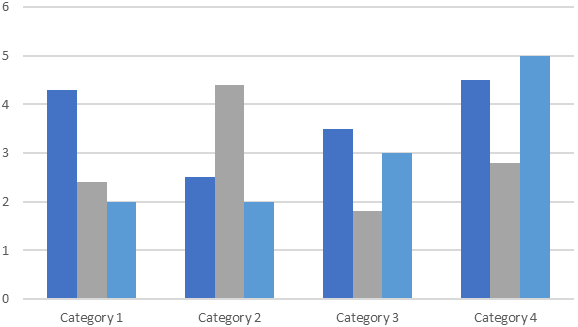
aAffiliation A, University A, Country

bAffiliation B, University B, Country

cAffiliation C, University C, Country

Use graphs to show visualization of your data's analysis.

Use graphs to show visualization of your data's analysis.



Vongtathum, P. et al. (Eds.) (2025). Proceedings of the 18th International Conference on Educational Research. Thailand: Faculty of Education, Khon Kaen University