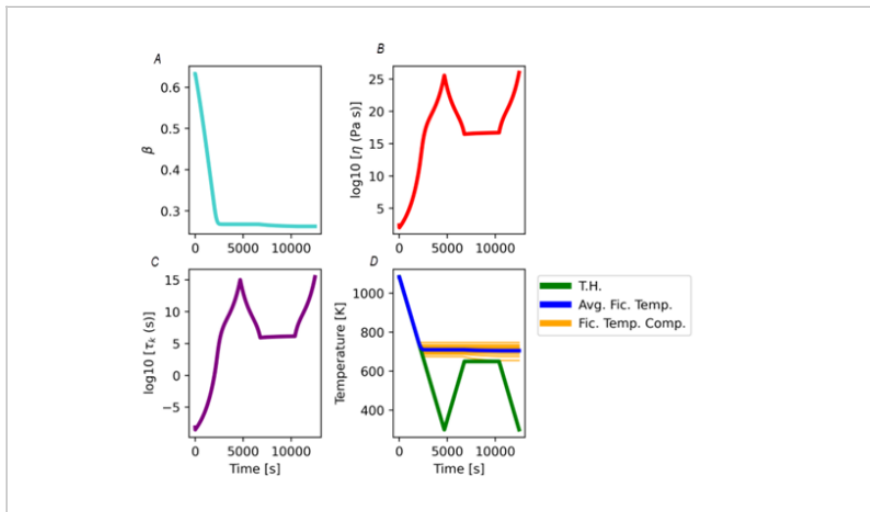


# Low Melting Glass Compositions, Articles, and Methods of Making the Same

ID# 2021-5324



The relaxation behavior of an exemplary glass composition

## Technology Summary

A new family of aluminosilicophosphate glass shows improved thermal stability, comparable chemical durability, and a lower melting point of 250° C over soda-lime silicate glass. Despite lower melting points, this glass improves corrosion resistance and decreases carbon emissions by reducing power consumption. The formed glass exhibits low fragility index reinforcing thermal and chemical stability. Moreover, the compositions display optical clarity with tunable tint. Glass matrix shows suitably high solubilities for transition metals for color glass applications and laser host materials.

## Application & Market Utility

Soda-lime processes include fiber-drawing, float-processing, a press-and-blow process, a blow-and-blow process, and glass blowing at around 1,450° C, releasing 86 million tons of CO2 annually. Beyond commodity applications, glass has higher value-added use in the automotive industry, electronic industry, spectroscopy etc. Glass compositions and articles must withstand exposure to moisture without losing their desired physical and chemical properties. This glass may be suitable for electronic or portable computing devices, medical and food industries, architectural and art applications.

## Next Steps

Based on earlier scholarly presentations, many glass manufacturers approached Dr. Mauro about downstream de-risking. A recent press release generated a wave of unsolicited interest that supports its commercial potential.

TECHNOLOGY READINESS LEVEL

4

### Seeking

Investment | Licensing | Research

### Keywords

- Phospho-based glass
- Non-carbonaceous
- Low Temperature
- Reduced carbon footprint
- Tableware

### Researchers

**John Mauro Ph.D.**

Dorothy Pate Enright Professor of Materials Science and Engineering

### Other Researchers

**M. Mancini, G. Cook, and C. Gallagher**

### Originating College

College of Earth & Mineral Sciences

### Office of Technology Management Contact

Smith, Matthew  
mds126@psu.edu  
814-863-1122



Invent Penn State is a Commonwealth-wide initiative to spur economic development, job creation, and student career success. Invent Penn State blends entrepreneurship-focused academic programs, business startup training and incubation, funding for commercialization, and university-community collaborations to facilitate the challenging process of turning research discoveries into valuable products and services that can benefit Pennsylvanians and humankind. Learn more at [invent.psu.edu](http://invent.psu.edu).

Penn State is an equal opportunity, affirmative action employer, and is committed to providing employment opportunities to all qualified applicants without regard to race, color, religion, age, sex, sexual orientation, gender identity, national origin, disability or protected veteran status.