

Response to “Comment on ‘The reality of residual entropies of glasses and disordered crystals’” [J. Chem. Phys.129, 067101 (2008)]

Martin Goldstein

Citation: [The Journal of Chemical Physics](#) **129**, 067102 (2008); doi: 10.1063/1.2965903

View online: <http://dx.doi.org/10.1063/1.2965903>

View Table of Contents: <http://scitation.aip.org/content/aip/journal/jcp/129/6?ver=pdfcov>

Published by the [AIP Publishing](#)

Articles you may be interested in

[Response to “Comment on ‘Experimental evidence for excess entropy discontinuities in glass-forming solutions’” \[J. Chem. Phys.139, 047101 \(2013\)\]](#)

J. Chem. Phys. **139**, 047102 (2013); 10.1063/1.4812930

[Comment on “Experimental evidence for excess entropy discontinuities in glass-forming solutions” \[J. Chem. Phys.136, 074515 \(2012\)\]](#)

J. Chem. Phys. **139**, 047101 (2013); 10.1063/1.4812929

[Response to “Comment on ‘On the theoretical determination of the Prigogine-Defay ratio in glass transition’” \[J. Chem. Phys.138, 067101 \(2012\)\]](#)

J. Chem. Phys. **138**, 067102 (2013); 10.1063/1.4790649

[Comment on: “On the reality of residual entropies of glasses and disordered crystals” \[J. Chem. Phys.128, 154510 \(2008\)\]](#)

J. Chem. Phys. **129**, 067101 (2008); 10.1063/1.2965901

[On the reality of residual entropies of glasses and disordered crystals](#)

J. Chem. Phys. **128**, 154510 (2008); 10.1063/1.2899642

A promotional banner for AIP Applied Physics Reviews. On the left is a thumbnail of a journal cover for 'AIP Applied Physics Reviews' featuring a diagram of a device. The main part of the banner has a blue background with a bright light source on the right. The text 'NEW Special Topic Sections' is prominently displayed in white. Below this, on an orange background, it says 'NOW ONLINE' in yellow, followed by 'Lithium Niobate Properties and Applications: Reviews of Emerging Trends' in white. The AIP Applied Physics Reviews logo is in the bottom right corner.

NEW Special Topic Sections

NOW ONLINE
Lithium Niobate Properties and Applications:
Reviews of Emerging Trends

AIP Applied Physics Reviews

Response to “Comment on ‘The reality of residual entropies of glasses and disordered crystals’” [J. Chem. Phys. **129**, 067101 (2008)]

Martin Goldstein^{a)}

299 Riverside Drive, Apt 7A, New York, New York 10025, USA

(Received 18 June 2008; accepted 10 July 2008; published online 8 August 2008)

[DOI: [10.1063/1.2965903](https://doi.org/10.1063/1.2965903)]

The abstract of my paper¹ criticized by Gupta and Mauro² in their comment begins with the following two sentences: “We show that the hypothesis that the configurational entropy of a liquid disappears when it is kinetically frozen into a single glass state implies a spontaneous decrease of entropy. We show further that this is not an innocuous exception to the second law that requires a slight modification of that law, but rather implies directly the possibility of an uncompensated conversion of heat to work.” In the body of the paper I give a specific example: thermodynamic data show that if a glass loses its configurational entropy at the

laboratory glass transition, it would have a greatly enhanced solubility that would enable osmotic work to be done at the expense of heat extracted from a reservoir. This in turn implies the possibility of a nearly isothermal cyclical process in which heat is converted to work with almost 100% efficiency, constituting a perpetual motion machine of the second kind. This is the main point of my paper, and it is one that Gupta and Mauro failed to address.

^{a)}Electronic mail: ifg2@columbia.edu.

¹M. Goldstein, *J. Chem. Phys.* **128**, 154510 (2008).

²P. K. Gupta and J. C. Mauro, *J. Chem. Phys.* **129**, 067101 (2008).