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

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The abstract of my paper[1] criticized by Gupta and Mauro[2] 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.

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

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

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