

4-2018

Question 1: Automobile Air Use; Question 2: Personal Air Use

Larry Weinstein
Old Dominion University

Follow this and additional works at: https://digitalcommons.odu.edu/physics_fac_pubs

 Part of the [Physics Commons](#), and the [Science and Mathematics Education Commons](#)

Repository Citation

Weinstein, Larry, "Question 1: Automobile Air Use; Question 2: Personal Air Use" (2018). *Physics Faculty Publications*. 173.
https://digitalcommons.odu.edu/physics_fac_pubs/173

Original Publication Citation

Weinstein, L. (2018). Question 1: Automobile air use; Question 2: Personal air use. *Physics Teacher*, 56(4), 257-257. doi:10.1119/1.5028246

calculations for denatured molten salt reactors: Assessing resource requirements and proliferation-risk attributes,” *Ann. Nucl. Energy* 75, 261–267 (2015).

4. H. Feiveson, A. Glaser, Z. Mian, and F. von Hippel, *Unmaking the Bomb* (MIT Press, Cambridge, MA, 2014).
5. R. Muller, *Physics for Future Presidents* (W. W. Norton and Company, New York, 2008).
6. The Generation IV International Forum, “Charter of the Generation IV International Forum,” <http://www.gen-4.org/PDFs/GIFcharter.pdf>, accessed on Sept. 17, 2016.
7. A. Juhasz, R. Rarick, and R. Rangarajan, “High Efficiency Nuclear Power Plants Using Liquid Fluoride Thorium Reactor Technology,” 7th International Energy Conversion Engineering Conference, Denver, CO (August 2–5, 2009).
8. P. DiPietro, *Improving Efficiency of Coal-Fired Power Plants for Near Term CO₂ Reductions* (National Energy Technology Laboratory, United States Department of Energy, Washington, DC, Nov. 2009).
9. J. R. Engel et al., *Conceptual Design Characteristics of a Denatured Molten-Salt Reactor with Once-Through Fueling*, ORNL/TM-7207 (Oak Ridge National Laboratory, Oak Ridge, TN, 1980).
10. P. N. Haubenreich and J. R. Engel, “Experience with molten-salt reactor experiment,” *Nucl. Appl. Technol.* 9, 118–139 (1969).
11. P. R. Kasten, E. S. Bettis, H. F. Bauman, and W. L. Carter, *Summary of Molten-Salt Breeder Reactor Design Studies*, ORNL-TM-A467 (Oak Ridge National Laboratory, Oak Ridge, TN, 1966).
12. N. Endicott, *Report for the All Party Parliamentary Group on Thorium Energy – Thorium-Fuelled Molten Salt Reactors* (The Weinberg Foundation, UK, June 2013).
13. T. Ehresman (ed.), “Molten Salt Reactor (MSR),” (Fact Sheet), 08-GA50044-17-R1 R6-11 (Idaho National Laboratory), <http://www4vip.inl.gov/research/molten-salt-reactor/>, accessed on Nov. 29, 2016.

14. R. Pandit, “Forces gung-ho on N-arsenal: Navy chief confident despite scientist calling pokhran ‘fizzle,’” <http://epaper.timesofindia.com/Repository/ml.asp?Ref=VE9JTS8yMDA5LzA4LzI4I0FyMDE1MDA>, accessed on Nov. 29, 2016.
15. Readers can view the appendix at *TPT Online*, <http://dx.doi.org/10.1119/1.5028245>, under the Supplemental tab.

Gregory A. DiLisi received his BS from Cornell University in applied and engineering physics and his MS and PhD from Case Western Reserve University in experimental physics. He is currently an associate professor at John Carroll University, where he teaches physics, science methods, and instructional technology courses. As an experimental physicist, he specializes in liquid crystals, with his recent research focusing on stabilizing liquid bridges that shift from micro- to hyper-gravity environments. In the area of science education, his research has focused on problem-solving and team-building in engineering and the sciences. gdlisi@jcu.edu

Allison Hirsch studied international studies and French at Case Western Reserve University and obtained a master’s degree in history from the University of Chicago before earning her Master of Education degree from John Carroll University. Currently, she is a high school social studies teacher in Northeast Ohio.

Meredith Murray attended the University of Arizona and obtained a B.S. in Science Education before earning her Masters of Secondary Education at John Carroll University. She is currently teaching seventh and eighth grade science at Joseph and Florence Mandel Jewish Day School in Beachwood, OH.

Richard A. Rarick received his BS from Cleveland State University in electrical engineering and his MS from Cleveland State University in applied mathematics. After working in the private sector as an engineer in the fields of digital signal processing and control theory, he now is a member of the faculty in the Department of Electrical Engineering and Computer Science at Cleveland State University specializing in electronics, control theory, electro-mechanical energy conversion, and embedded systems.

Fermi Questions

Larry Weinstein, Column Editor
Old Dominion University, Norfolk, VA 23529;
weinstein@odu.edu

► Question 1: Automobile air use

How long would it take a running, gasoline-powered automobile to use up the oxygen in a garage?

► Question 2: Personal air use

How long would it take a person to use up the oxygen in a garage?

Look for the answers online at tpt.aapt.org

Question suggestions are always welcome!

For more Fermi questions and answers, see *Guesstimation 2.0: Solving Today's Problems on the Back of a Napkin*, by Lawrence Weinstein (Princeton University Press, 2012).

DOI: 10.1119/1.5028246