

Materials List for:

Production of Synthetic Nuclear Melt Glass

Joshua J. Molgaard¹, John D. Auxier II^{2,3}, Andrew V. Giminaro^{2,3}, Colton J. Oldham², Jonathan Gill², Howard L. Hall^{2,3,4}

¹Department of Physics and Nuclear Engineering, United States Military Academy

²Department of Nuclear Engineering, University of Tennessee

³Radiochemistry Center of Excellence (RCoE), University of Tennessee

⁴Institute for Nuclear Security, University of Tennessee

Correspondence to: Joshua J. Molgaard at Joshua.Molgaard@usma.edu

URL: <https://www.jove.com/video/53473>

DOI: [doi:10.3791/53473](https://doi.org/10.3791/53473)

Materials

Name	Company	Catalog Number	Comments
High Temperature Furnace (HTF)	Carbolite	HTF 18	1,800 °C HTF used to melt samples
High Temperature Drop Furnace	CM Inc.	1706 BL	1,700 °C Drop Furnace used to melt samples
Graphite Crucibles	SCP Science	040-060-041	27 ml high purity graphite crucibles (10 pack)
Crucible Tongs	Grainger	5ZPV0	26 in., stainless steel tongs for handling crucibles
Heat Resistant Gloves	Grainger	8814-09	Gloves used to protect hands from heat during sample intro/removal
Mortar & Pestle	Fisherbrand	S337631	300 ml, Ceramic mortar and pestle for powdering and mixing
Micro Balance	Grainger	8NJG2	220 g Cap, high precision scale for measuring powder mass
Spatulas	Fisherbrand	14374	Metal spatulas for measure small quantities of powder
SiO ₂	Sigma-Aldrich	274739-5KG	Quartz Sand CAS Number: 14808-60-7
Al ₂ O ₃	Sigma-Aldrich	11028-1KG	Aluminum Oxide Powder CAS Number: 1344-28-1
CaO	Sigma-Aldrich	12047-2.5KG	Calcium Oxide Powder CAS Number: 1305-78-8
FeO	Sigma-Aldrich	400866-25G	Iron Oxide Powder CAS Number: 1345-25-1
MgO	Sigma-Aldrich	342793-250G	Magnesium Oxide Powder CAS Number: 1309-48-4
Na ₂ O	Sigma-Aldrich	36712-25G	Sodium Oxide Powder CAS Number: 1313-59-3
KOH	Sigma-Aldrich	278904-250G	Potassium Hydroxide Pellets CAS Number: 12030-88-5
MnO	Sigma-Aldrich	377201-500G	Manganese Oxide Powder CAS Number: 1344-43-0
TiO ₂	Sigma-Aldrich	791326-5G	Titanium Oxide Beads CAS Number: 12188-41-9