



## Crucible melting a variety of materials in a nitrogen atmosphere

**Objective** Heat to melting point various materials in a nitrogen atmosphere in a graphite or molybdenum crucible.

**Material** Magnesium fluoride, tantalum pentoxide, aluminum, yttrium fluoride, germanium, hafnium or titanium dioxide and a Pyrex bell jar

**Temperature** Melting temperatures varies

**Frequency** 160 kHz

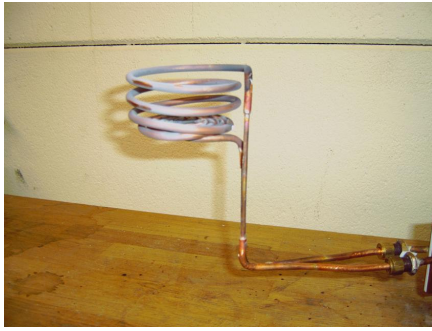
**Equipment**

- Ambrell 10 kW induction heating system, equipped with a remote workhead containing two 1.0 $\mu$ F capacitors for a total of 0.5  $\mu$ F
- An induction heating coil designed and developed specifically for this application.

**Process** The crucible is heated using a coil with a four turn pancake at the base that extends upward into a three turn helical coil. Times and melting temperatures vary due to the properties of the different materials.

**Results/Benefits** Induction heating provides:

- Faster process time than electron beam heating.
- Repeatable, consistent results.
- Even distribution of heating.



Side and top view of custom coil



Various materials in the crucibles



Heating of crucible under Pyrex jar with the nitrogen flowing in from underneath

