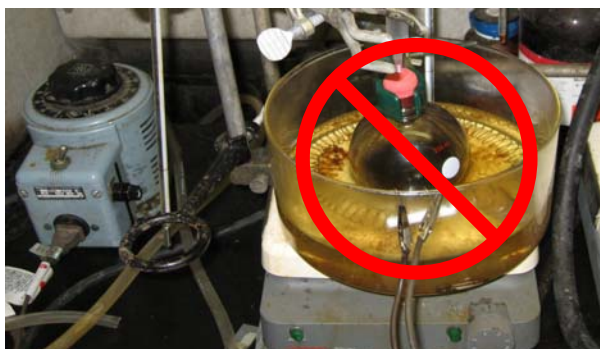


Departments of Chemistry and Materials Science & Engineering, University of Arizona

Control the Heat – Oil Bath Heating Safety

Oil baths are often used as heat sources in the laboratory. One of the more common methods for heating these oils baths is with resistive heating using a nichrome wire coil (submerged in the oil) connected to an electrical plug using alligator clips (see photo below). These systems have exposed wires and are **INCREDIBLY DANGEROUS** due to the potential for electrical shock, sparks igniting flammable vapors & fires due to overheating oil baths. It is with good reason that they are called **suicide cords** in common lab slang. **NEVER use an immersion heater that has exposed electrical contacts.**



Exposed wire Oil-Bath Heaters are dangerous because:

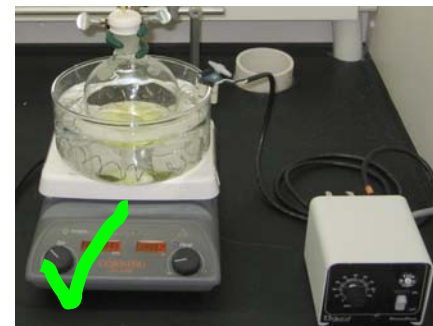
- **No temperature control** – the heating element gets as hot as it can with the power supplied. Oil baths can ignite.
- **Electrical shock from Exposed Wires**
- **Fire from electrical sparks igniting solvent vapors**

The Chemistry Electronics facility is developing a safer, fully insulated system with no loose connections for connecting oil baths to control devices. *Email Marcus Perry at mlperry@email.arizona.edu for more information.*

*Oil baths heated with coils of nichrome wire can pose **fire and electrical shock hazards**. In preparation for this Privy Press, we visited a U of A research lab to observe how these oil baths are used. During the demonstration the un-insulated and un-secured alligator clips connecting the nichrome wire to the power supply touched several times generating large sparks. Fortunately, no one was injured.*

Additional safety tips:

1. Never plug resistive heaters directly into the wall socket!
2. Make sure your heating bath will safely operate at the temperature range you need (Table below)
3. Try using a hot plate and temperature controller to heat your oil bath.
4. Temperature controllers with safety shut-offs can prevent overheating and fires.



Bath Material	FP °C	Range °C
Mineral Oil	113	25 - 100
Paraffin Wax	varies	55 - 180
Silicone Oil	150 - 350	25 - 230
Sand	NA	25-500+