

## Glowing Pickle

**Description:** A dill pickle is used to conduct electricity when a voltage is applied. After some time an orange glow associated with sodium emission is observed.

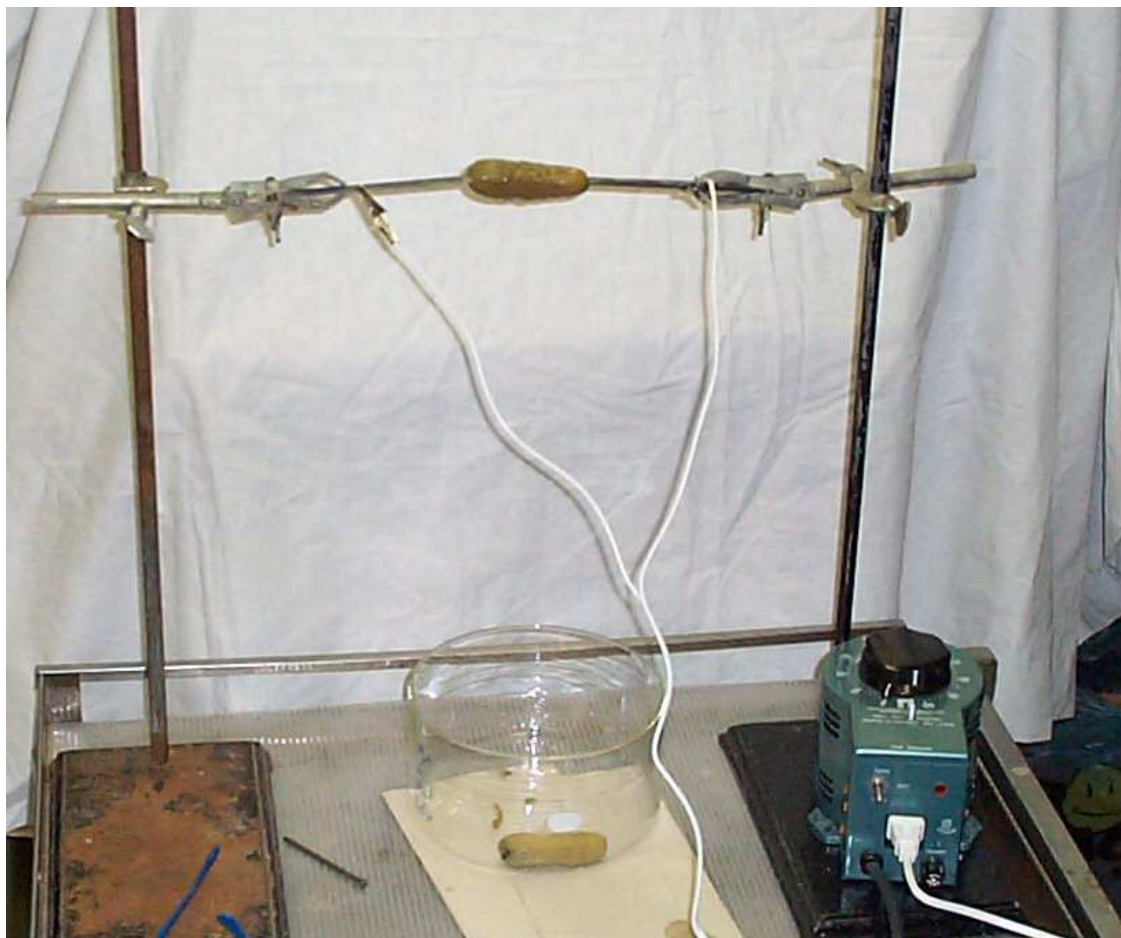
### Materials:

Large dill pickle	2 ring stands
2 forks with insulating covers	2 clamps
Modified electrical cable	Variac

### Procedure:

For large lecture halls, perform demonstration with lights dimmed or off.

1. Setup apparatus as shown in the figure below and according to the *Appling J. Chem. Ed.* reference. A brief description is given here. Insert electrodes (forks with insulating wrap around the handle) into opposite ends of the pickle. Make sure the forks do not touch each other inside the pickle. Clamp these onto the two ring stands.
2. Using alligator clips, connect the exposed electrical cable to the electrodes and plug the cable into the power supply (variac). Once the operator ensures that the apparatus is not in contact with anyone the variac can be turned on and the voltage slowly increased to 110 V.
3. As illustrated in the videos below, the pickle will first drip and then sizzle and smoke prior to glowing. The color of the glowing can be compared to a sodium flame test to indicate the source of the color observed in the pickle.



**Discussion:**

In this demonstration the high concentration of sodium chloride in the pickle (salty flavor) serves as a sufficient electrolyte solution to conduct electricity. Once the variac is turned on, arcing will occur in the pickle and after a short time an orange glow will be observed. This orange color is a result of a  $3p \rightarrow 3s$  emission from Na atoms inside the pickle. This can be compared to a standard sodium flame test to reveal the source of glow inside the pickle.

**Safety:** Be careful not to touch the setup while the variac is turned on. Do not ingest the pickle.

**Disposal:** Pickle can be disposed of in regular waste unless it was “pickled” with a different salt solution in which case it must be disposed of in a solid waste container.

**References:**

Appling, J. R.; Yonke, F. J.; Edgington, R. A.; Jacobs, S. M. *J. Chem. Educ.* **1993**, *70*, 250.

Rizzo, M. M.; Halmi, T. A.; Jircitano, A. J.; Kociolek, M. G.; Magraw, J. A. *J. Chem. Educ.* **1996**, *73*, 456.

Weimer, P. M.; Battino, R. *J. Chem. Educ.* **2005**, *82*, 545. (line spectra variation)

**Video :**

<http://www.youtube.com/watch?v=sVkrs6YVNYo>

<http://www.youtube.com/watch?v=JUbp8CdesY>