

# Ripping Pop Cans in Half

This demonstration can be used on the first day of a chemistry course to show that working problems in chemistry is easy, but only if you know how to go about it. It can also be used when discussing single-replacement reactions, or when introducing redox reactions

## Chemicals and Equipment Needed – Demo

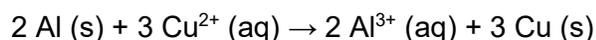
- 2 prepared pop cans – **A1**
- 1 unprepared (normal) pop can – **on top of H**

## Preparation

- There are usually prepared pop cans on A1. If not, see reverse side for how to prepare new ones.
- Make sure the prepared ones are marked with a **P**

## Presentation

- For a first day demonstration, select a student to “help” you. Give them the unprepared can and take a prepared one for yourself. Grip the can in both hands and rip it in half, then invite the student to do the same. They will probably just crumple the can.
- “Confer” with the student, re-explain how to rip the can, then hand them the other prepared can. This time the student will easily rip the can in half.
- For introducing single-replacement reactions or redox terminology, you may want to rip one prepared can and then explain how and why it worked.
- The prepared cans can be ripped in half effortlessly because copper ions react with the aluminum exposed by the scoring so that the can is only held together with paint:



## Clean-Up

- Recycle the cans

## Acknowledgements:

- After watching Rob Lewis of Weird Science rip pop cans, we were inspired to follow his example.
- Andrea Huff, a former OSU lecturer, used this demo in her intro lecture to make the point that “working problems in chemistry is easy, IF you know how to go about it.” She didn’t explain how it works until redox reactions came up later in the course.

# Pop Can Preparation

## Chemicals and Equipment Needed

- d-H<sub>2</sub>O
- 10 empty pop cans – **on top of H**
  - Or however many fit in the baking dish
- Sharp nail for scoring inside – **U1**
- CuCl<sub>2</sub> – **E5**
  - You must use CuCl<sub>2</sub>. Other copper salts will not work.
- 2 L beaker – **Q2**
- Glass baking dish – **P5**

## Preparation – Making more cans

- Heat 1.5 L d-H<sub>2</sub>O almost to boiling
- Remove the tabs and score around the inside the cans with the nail. Try to aim for the middle of the can so it can be easily gripped. Go around several times to expose more metal. You want to cut through the plastic liner without cutting through the can. It may take a few tries, but we have a lot of cans. Place the cans in the baking dish, in case of leakage later.
- Add a scoop of CuCl<sub>2</sub> to the cans and fill with ~150 mL hot water, above the score marks
- Let the cans sit 10 minutes, then empty and carefully rinse.
  - There should be only a thin layer of aluminum and paint holding the can together.
- Mark the cans with a **P** on top
- When delivering, give the instructor two prepared cans and a regular can.