The LEAGUE
of Amazing Programmers

DIY Battery

The League of Amazing Programmers
EE Class – Level 1

Materials

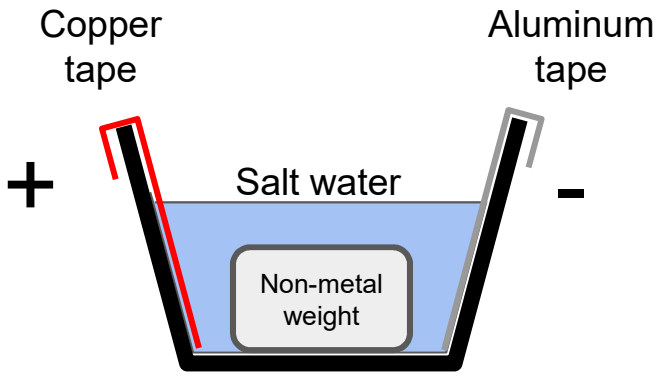
- 3 dosage cups
- ½ cup water
- ½ tsp salt
- 30 cm long copper tape strip, 6 pcs
- 30 cm long aluminum tape strip, 6 pcs
- Small stones (for weight)
- Jumper wires with small alligator clips, 4 pcs
- Multimeter
- Digital clock with wires

Instructions

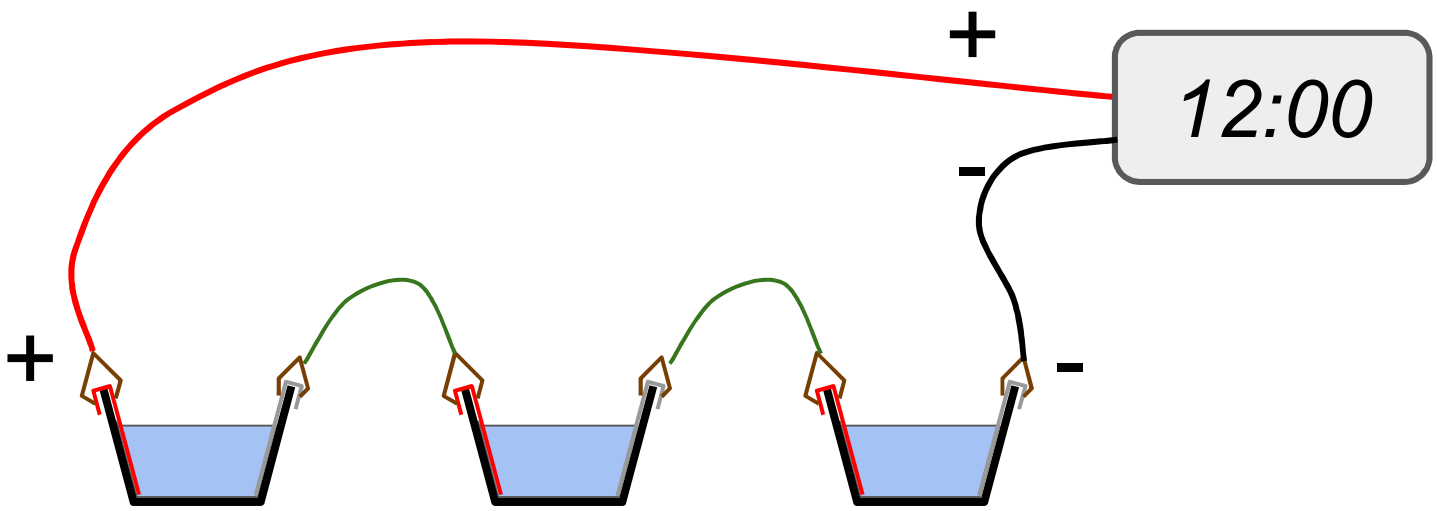
This creates a simple battery using copper tape (often used for crafts), aluminum tape (often used for home heater ducting), and a salt water solution. It doesn't put out much current (about 1 mA max) but is enough to drive an LCD clock.

- Take a 30 cm length of each tape and tape on opposite sides of dosage cup
- Fold extra tape over the lip of the cup
- Wipe metal tape clean to remove oils and other contaminants
- Add a small stone or other non-metal weight to help keep it stable
- Attach alligator clips and wire together
- Make a salt water solution with ½ cup water and ½ to 1 teaspoon of salt
- Pour salt solution into cup. Fill ½ to ⅔ to the top.

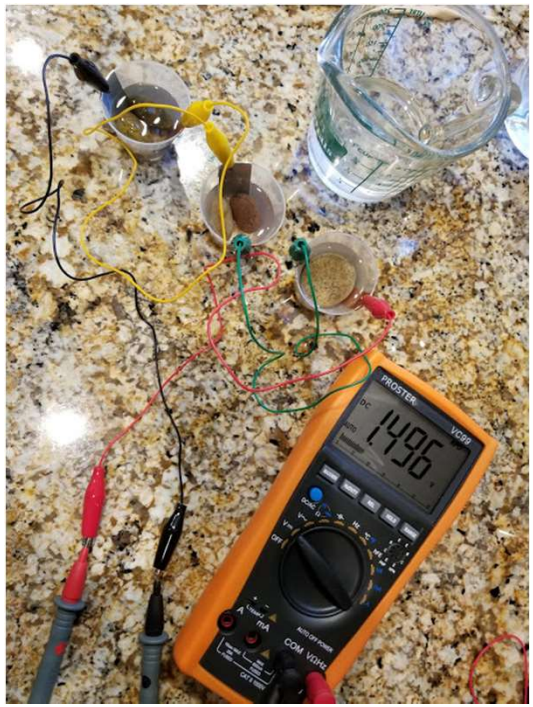
How to make one cell, about 0.5 Volts



Wire three cells together, about 1.5 Volts!



Example Setup



Appendix

Electronegativity

Electronegativity is a chemical property which describes how well an atom can attract an electron to itself.

Electronegativity values of the elements (Pauling scale)

H 2.1																	He
Li 1.0	Be 1.5											B 2.0	C 2.5	N 3.0	O 3.5	F 4.0	Ne
Na 0.9	Mg 1.2											Al 1.5	Si 1.8	P 2.1	S 2.5	Cl 3.0	Ar
K 0.8	Ca 1.0	Sc 1.3	Ti 1.5	V 1.6	Cr 1.6	Mn 1.5	Fe 1.8	Co 1.8	Ni 1.8	Cu 1.9	Zn 1.6	Ga 1.6	Ge 1.8	As 2.0	Se 2.4	Br 2.8	Kr 3.0
Rb 0.8	Sr 1.0	Y 1.2	Zr 1.4	Nb 1.6	Mo 1.8	Tc 1.9	Ru 2.2	Rh 2.2	Pd 2.2	Ag 1.9	Cd 1.7	In 1.7	Sn 1.8	Sb 1.9	Te 2.1	I 2.5	Xe 2.6
Cs 0.7	Ba 0.9	La 1.1	Hf 1.3	Ta 1.5	W 1.7	Re 1.9	Os 2.2	Ir 2.2	Pt 2.2	Au 2.4	Hg 1.9	Ti 1.8	Pb 1.8	Bi 1.9	Po 2.0	At 2.2	Rn 2.4
Fr 0.7	Ra 0.7	Ac 1.1															

Ce 1.1	Pr 1.1	Nd 1.1	Pm 1.1	Sm 1.1	Eu 1.1	Gd 1.1	Tb 1.1	Dy 1.1	Ho 1.1	Er 1.1	Tm 1.1	Yb 1.1	Lu 1.2
Th 1.3	Pa 1.5	U 1.7	Np 1.3	Pu 1.3	Am 1.3	Cm 1.3	Bk 1.3	Cf 1.3	Es 1.3	Fm 1.3	Md 1.3	No 1.3	Lr

References

- List of elecronegativity of the elments: https://sciencenotes.org/list-of-electronegativity-values-of-the-elements/
- How batteries work
  - https://www.youtube.com/watch?v=PyrWx4ExZE4
  - https://www.youtube.com/watch?v=9OVtk6G2TnQ
  - https://www.google.com/search?q=diy+lemon+battery&rlz=1C1NHXL_enUS754US754&oq=diy+lemon+battery&aqs=chrome..69i57.2926j0j4&sourceid=chrome&ie=UTF-8#kpvalbx=1
  - https://en.wikipedia.org/wiki/Electric_battery