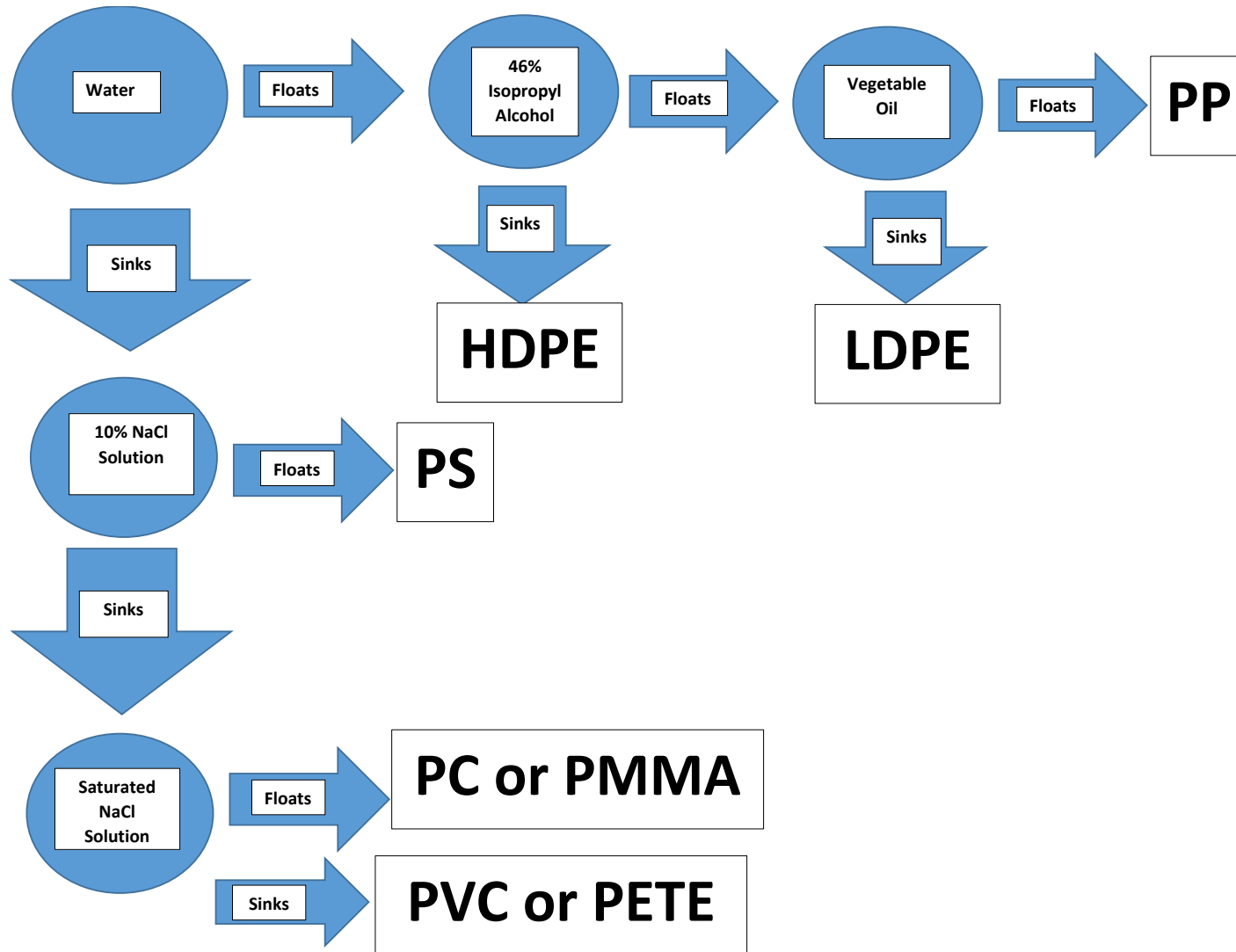## Identifying Unknown Polymers Using Density Measurements

Unknown Polymer Sample	Mass (grams)	Volume (mL)	Density (g/mL)	Name of unknown polymer
1				
2				
3				
4				
5				
6				

Polymer Density Chart

PETE (Polyethylene terephthalate):   1.38 g/ml

HEPE (high density polyethylene):   0.93 g/ml

PVC (polyvinyl chloride):   1.38 g/ml

LDPE (low density polyethylene):   0.92 g/ml

PP (polypropylene):   0.86 g/ml

PS (polystyrene):   1.04 g/ml

Polymer Float/Sink Test

Water — Floats → **46% Isopropyl Alcohol** — Floats → **Vegetable Oil** — Floats → **PP**

Water — Sinks → **10% NaCl Solution**

46% Isopropyl Alcohol — Sinks → **HDPE**

Vegetable Oil — Sinks → **LDPE**

10% NaCl Solution — Floats → **PS**

10% NaCl Solution — Sinks → **Saturated NaCl Solution**

Saturated NaCl Solution — Floats → **PC or PMMA**

Saturated NaCl Solution — Sinks → **PVC or PETE**

Conclusion Questions:

1. Is density measurement accurate method for identifying polymers/elements? Why?

2. Can density measurements correctly identify PVC and PETE? Why?

3. What other tests can be used to identify unknown polymers/elements?

4. Are higher density materials stronger or weaker than low density materials? Why?