

1. Turn system on by flipping the black toggle switch to the ON (I) position. This will start the Computer and the HazMatID system.

2. Select your User name and enter your Password. They have been set up by your administrator in QualiID.

3. Select START to continue.

4. Clean the sensor and press CONTINUE to collect a background reference.

5. Enter the Incident name and Sample ID. Once the status switches from SCAN to READY select CONTINUE.

6. Place the sample on the sensor and select CONTINUE to complete the analysis. Your library hits will be displayed once finished scanning.

The HazMatID is intended to provide initial determinations and be used as an information resource in the field and not absolute or conclusive identification of unknown substances. The results provided by the using other appropriate techniques. Borell Technologies makes no recommendations nor does it assume any liability for how the information is utilized.

U.S. EPA Superfund

Made in USA

Hazard Categorization Uses

- **Identify containers with like contents**
- **Segregate based on hazard**
- **Sample based on screening results**

Field Screening



metals

noble gases

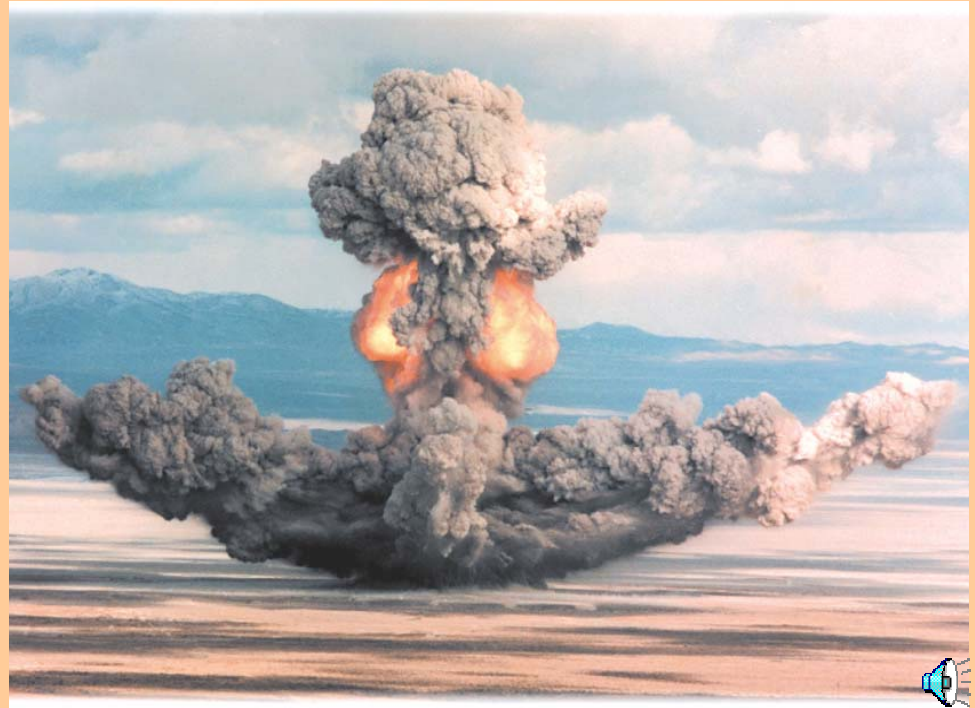


FIELD SCREENING TESTS

- EXPLOSIVE?
- CORROSIVE?
- WATER SOLUBLE?
- WATER REACTIVE?
- CYANIDE?
- OXIDIZER?
- HALIDE?
- OTHER TESTS
- DESCRIPTION
- SULFIDE?
- FLAMMABILITY?

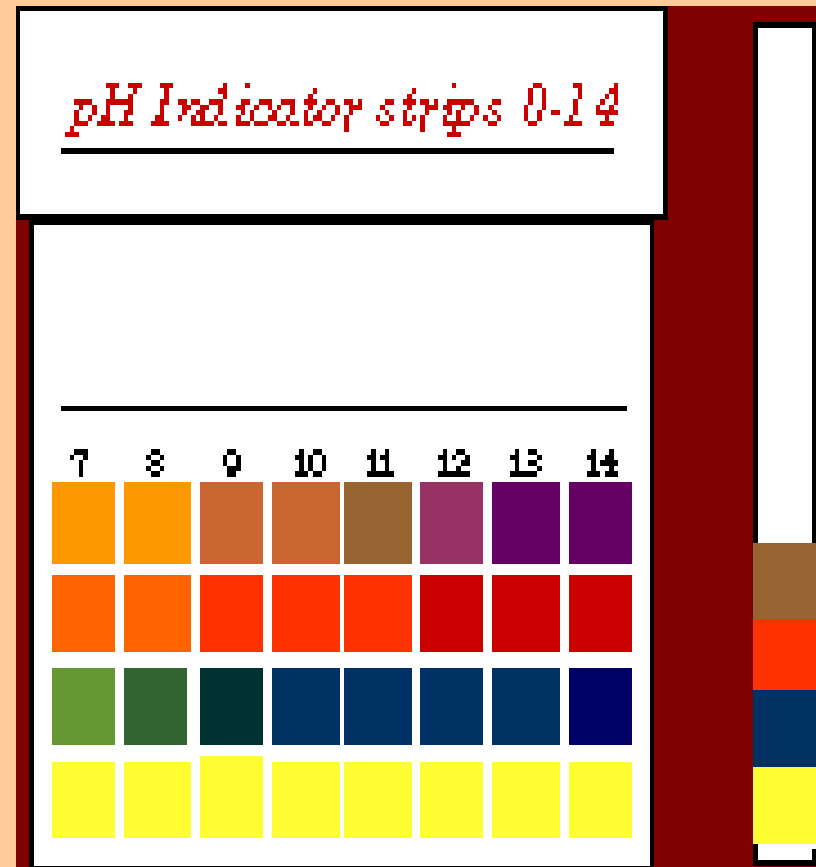
Explosive?

- Consult ERG
- Hair pin test
- Other references
- Orange DOT label
- Nitro- compounds
- Explosives kits



CORROSIVE

- pH paper
 - 0-6 Acid
 - 7 Neutral
 - 8-14 Base
-
- Bleach?
 - High concentrations?



pH of Common Items

BASIC	14.0	Strong Bases: NaOH, KOH, Ca(OH) ₂
	12.5	RCRA haz. waste
	12.0	Household ammonia
	10.0	Detergents and Baking Soda
	8.0	Seawater
	7.4	Blood
NEUTRAL	7.0	Pure water
	6.0	Rain
	4.0	Beer
	3.0	Orange juice, vinegar, wine, acid rain
ACIDIC	2.0	RCRA haz. waste/lemon juice, stomach acid
	1.0	Strong acids: HCl, HF, HI, H ₂ SO ₄ , HNO ₃
	0.0	Very acidic

Recognition of Common Corrosives

ACIDS

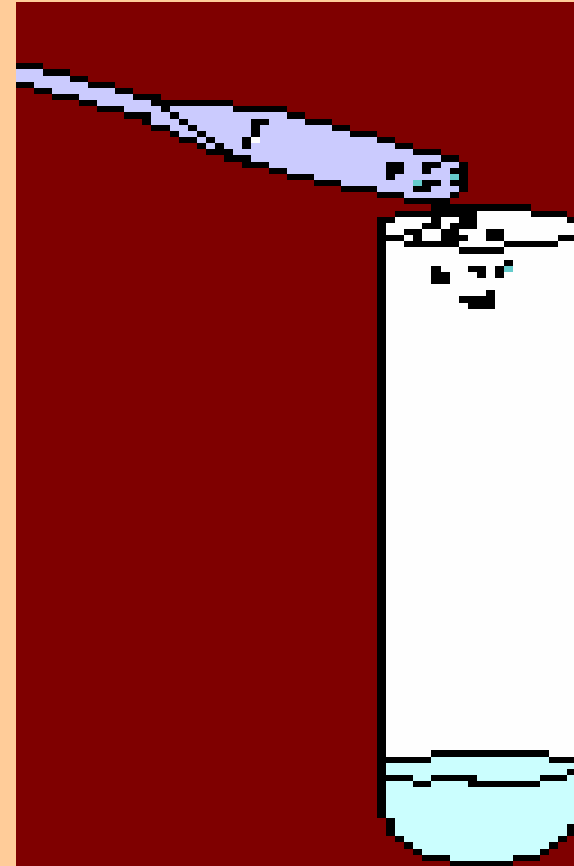
- Begin with Hydrogen “H”
- End in non-metal or nonmetal oxide
- Exceptions: Organic Acids (end in COOH), Phenol
- Examples: HCl, H₂SO₄, CH₃COOH, HF, HNO₃
- Usually liquids or a gas dissolved in water

BASES

- Metal + Hydroxide (OH)
- Metal + Oxygen
- Active Metal (column 1-2 on periodic table)
- Exceptions: Ammonia (NH₃), Amines, Carbonates
- Examples: NaOH, K₂O, Li, KOH, Ca(OH)₂, NaHCO₃
- Usually solids or solids dissolved in water

WATER SOLUBILITY

- DISSOLVES (Y/N)
- FLOAT (hydrocarbons)
- SINK (halogenated hydrocarbons)
- EMULSIFY (coffee creamer)
- REACTIVE—
 - HEAT
 - BUBBLES (flammable, toxic?)



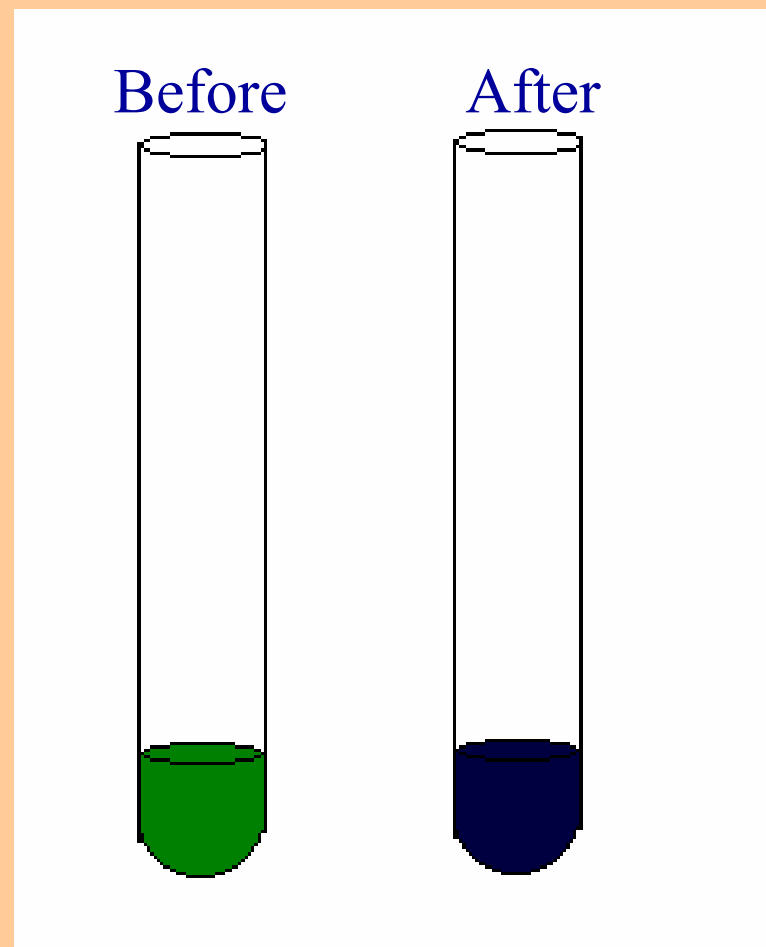
REACTIVES

- Normally unstable-reacts violently
- Mixes with water to form toxic or flammable gases
- Capable of detonation at STP or if heated in confinement
- Contains cyanide or sulfide and generates toxic gases, vapors, or corrosive fumes



CYANIDE

- Only if pH is greater than 7
- Use cyanide test by adding solid cyanide test 2 to a test tube with 1/4 inch cyanide test 1
- Add a pea size (or 1/4 inch) amount of the unknown
- Add 3-5 drops of Acid Test solution
- Deep Prussian blue indicates cyanide





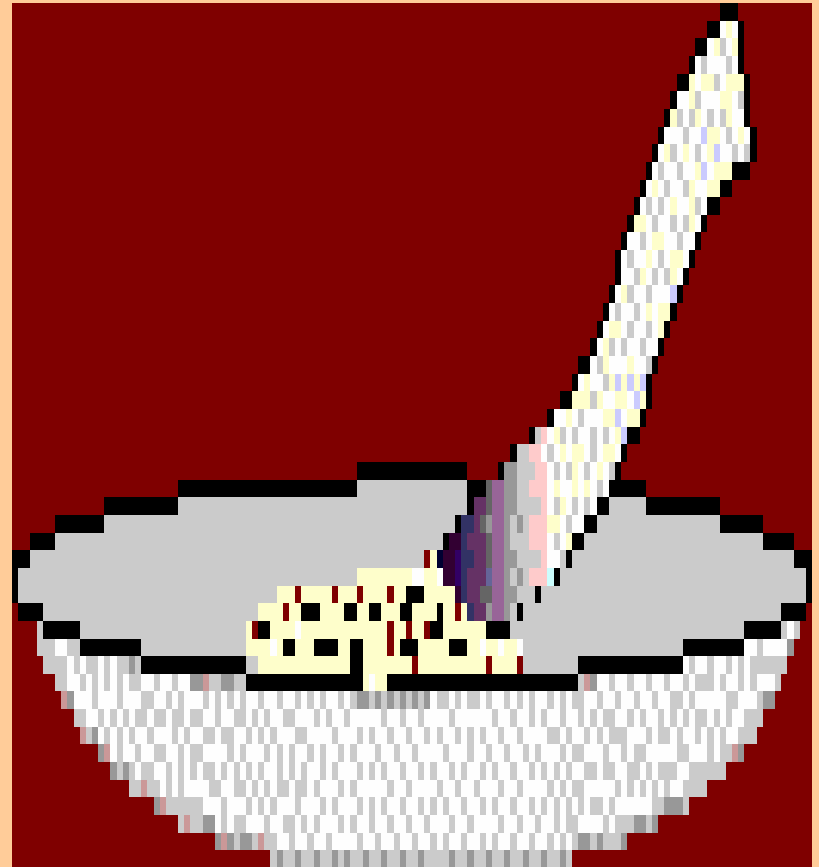
TOXICITY



- Toxicity Characteristic Leaching Procedure (TCLP) identifies 39 chemicals to test for in wastes for their ability to leach out and contaminate ground water
- Acutely hazardous wastes: (1) Oral LD_{50} less than 50 mg/kg, (2) a dermal LD_{50} of less than 200 mg/kg, or (3) an inhalation LC_{50} of less than 2 mg/kg.

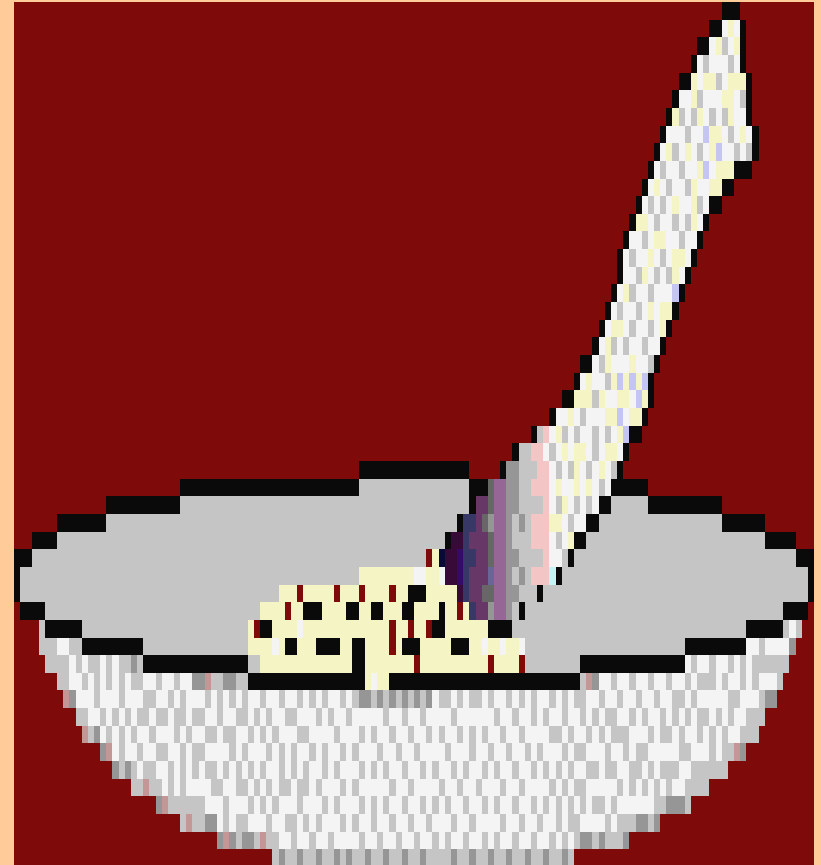
OXIDIZER TEST

- Use Potassium Iodide (KI) paper
- Acidify KI paper with 2-3 drops of acid test
- Hold paper over then touch unknown with paper
- Blue/black or purple color indicates an oxidizer



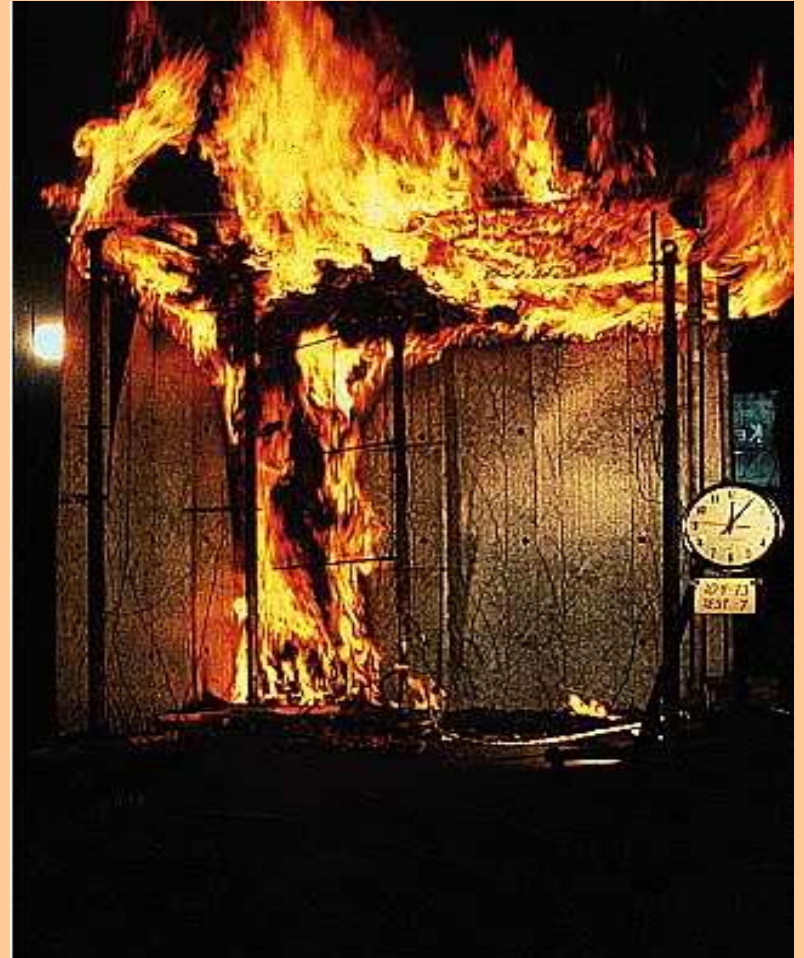
SULFIDE TEST

- Wet Sulfide Test Paper (Lead Acetate) with a few drops of water
- Touch paper to acidified unknown on watch dish
- Color change from white to brown indicates sulfide (lead may cause a black or silver color)



FLAMMABILITY

- Place a pool the size of a 50 cent piece on watch dish
- Bring a lit match slowly towards the watch dish
- Ignites B4 the edge
- Ignites when touched
- Match acts as wick



OTHER TESTS



- CGI - Combustible Gas Indicator
- PID - Photoionization Detector
- FID - Flame Ionization Detector
- Colorimetric Indicator (Drager) Tubes
- Oxygen Sensor

Colorimetric Indicator Tubes



- Measures: Compounds or Family of Compounds
- Units: PPM or % for Quantitative Measurements
- Range: Varies; Example: 1 Compound - 5 Different Tubes With Different Ranges

Photoionization Detector



- Measures: Organic and Inorganic Air Contaminants (Must have an Ionization Potential Below the Measuring Probe)
- Units: Indicates in PPM
- Range: .5 to 2000 ppm
- Probes: Hnu: 9.6eV, 10.2eV, and 11.7eV

Flame Ionization Detector



- Measures: Organic Atmospheric Contaminants (Compounds That Will Burn In a Flame)
- Units: Indicates in PPM
- Range: .5 to 1000 ppm

SensIR—Solid/Liquid ID of Covalently bonded (non-metals) compounds (mainly organics)



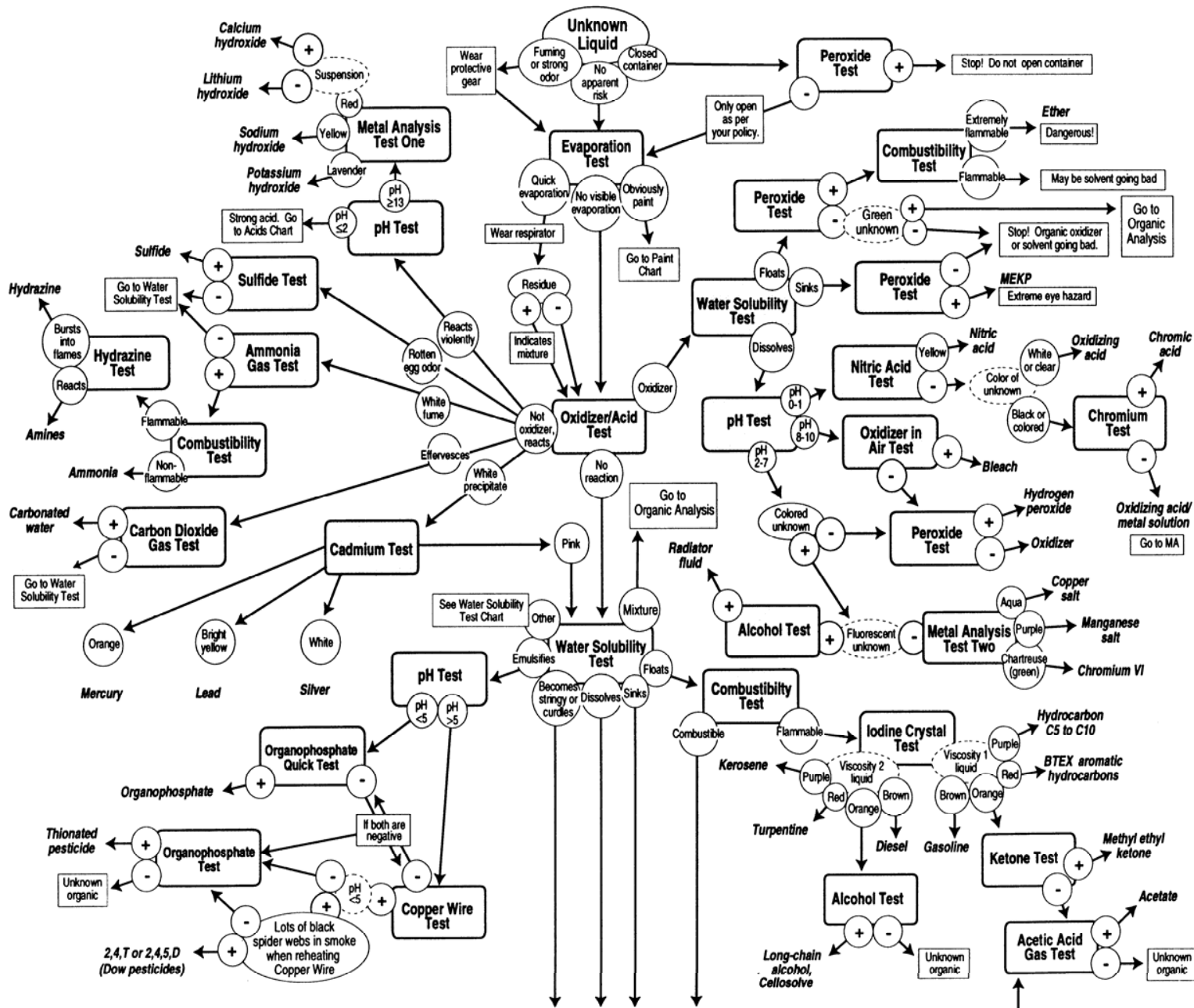
Summary

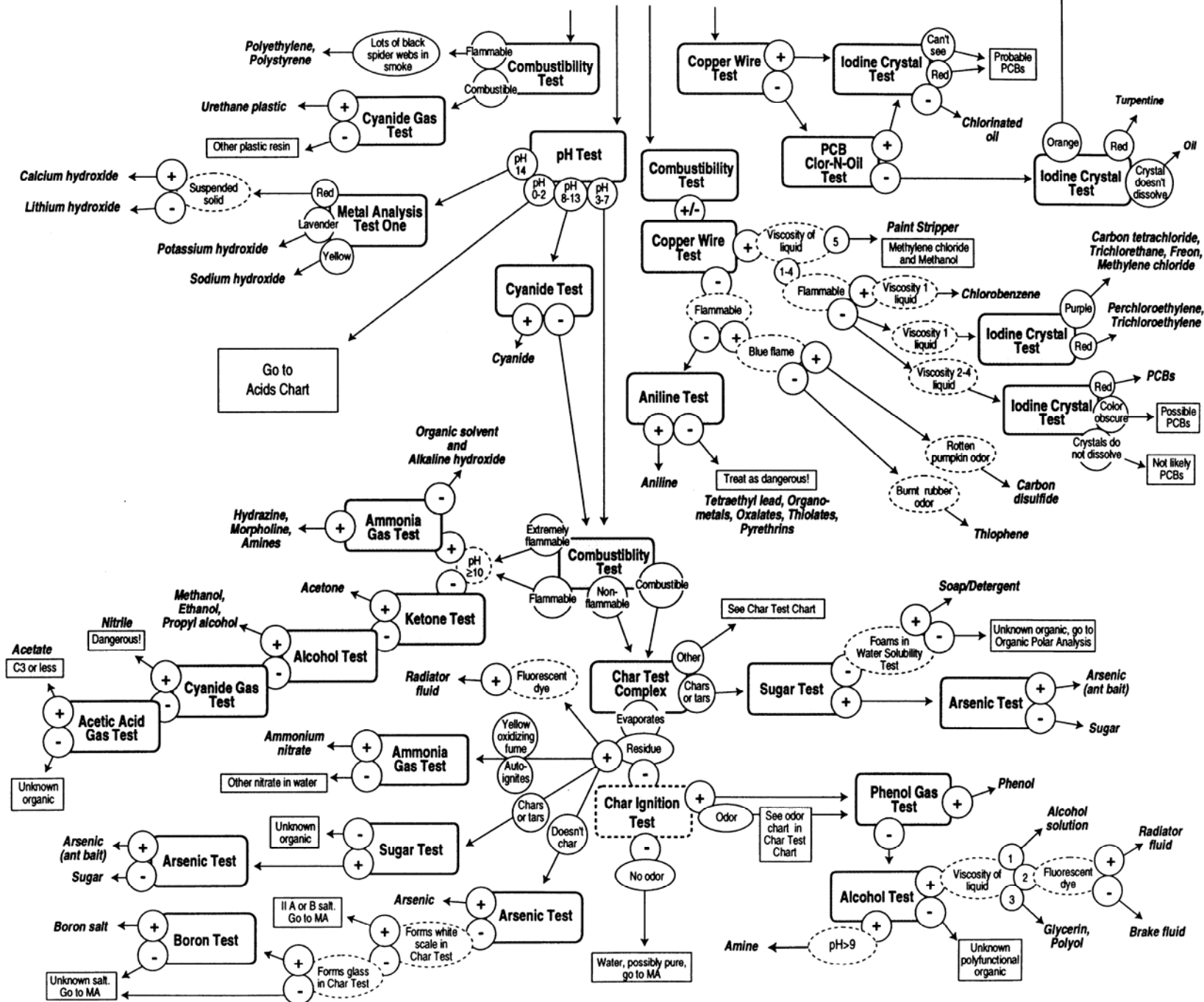
- Separate into the 9 DOT Classes
- Separate acids and bases
- Separate oxyacids from non-oxyacids
- Separate oxidizers from flammables
- Separate water reactives from water based solutions
- Multiple Classes are a separate class

A photograph showing two individuals in white protective suits working in a field setting. One person is leaning over a metal surface, possibly a table or equipment, while the other stands nearby. The background shows a white structure, likely a container or tent. The text "FIELD IDENTIFICATION OF UNKNOWN MATERIALS" is overlaid in large, bold, orange letters.

FIELD IDENTIFICATION OF UNKNOWN MATERIALS

Unknown Liquids Chart





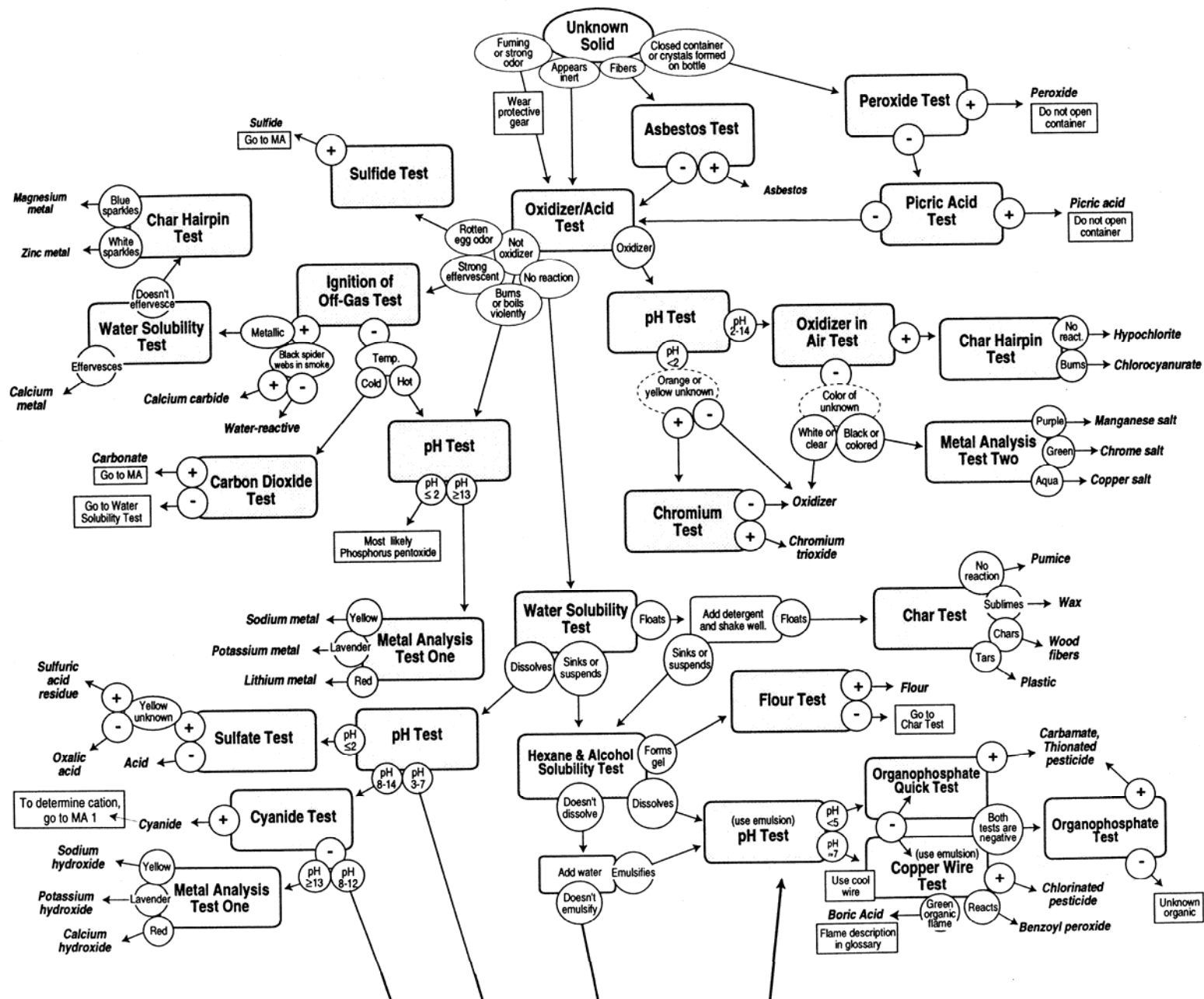
Iodine Crystal Test Results

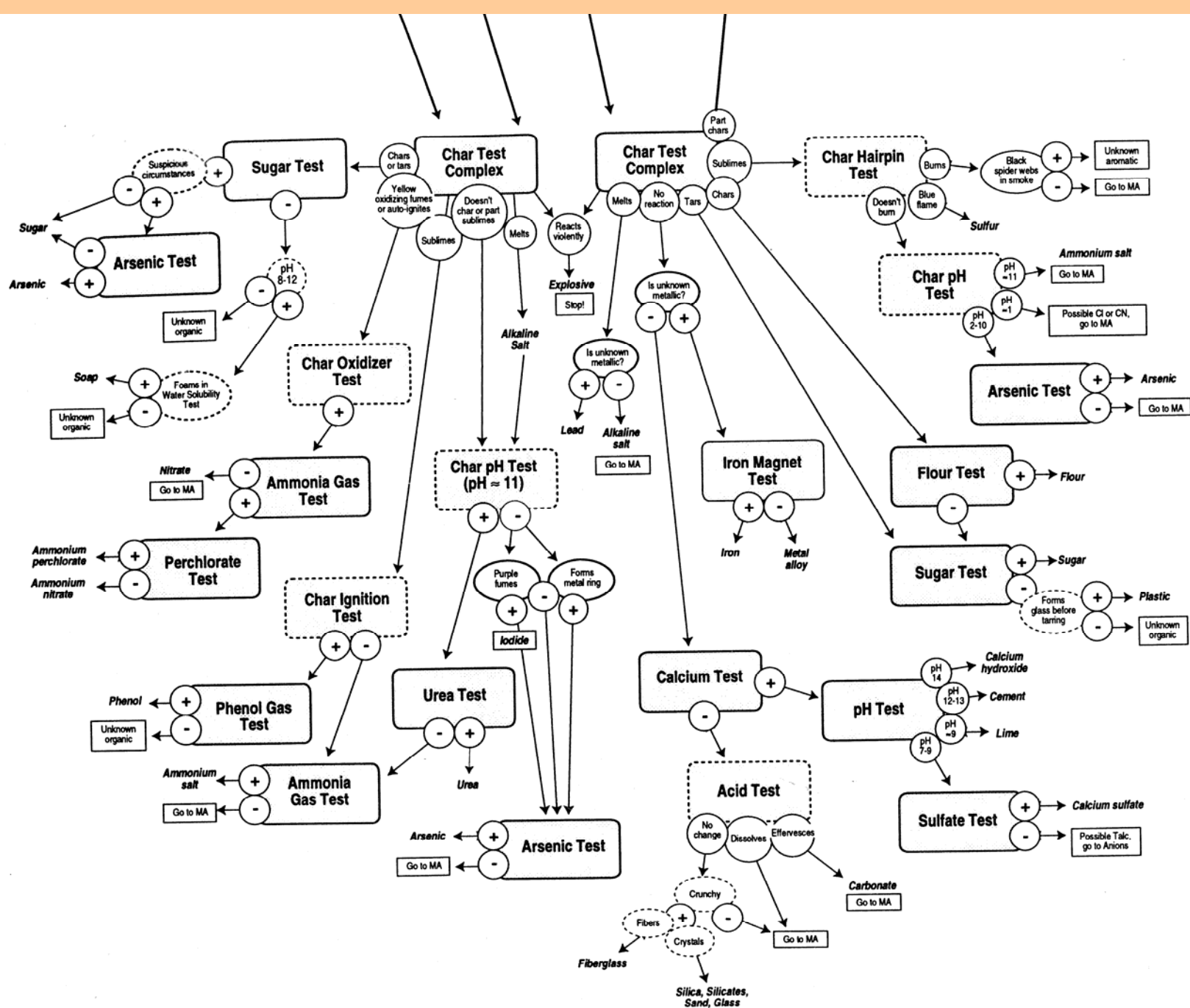


Hexane Toluene Acetone Methanol Gasoline Diesel Mineral Oil



HazCat® Chemical Identification System





CONCLUSION

- If properly applied the HazCat(TM) flowchart can assist in identifying materials in the field
- The large number of compounds and mixtures makes it difficult to always identify the unknown material
- Reference materials can also assist in the identification of materials in the field