

FLAME AND BEAD TESTS

Flame Colorations

Violet

Potassium compounds. Purple red through blue glass. Easily obscured by sodium flame. Bluish green through green glass. Rubidium and Cesium compounds impart same flame as potassium compounds

Blues

Azure.—Copper chloride. Copper bromide gives azure blue followed by green. Other copper compounds give same coloration when moistened with hydrochloric acid.

Light Blue.—Lead, Arsenic, Selenium.

Greens

Emerald.—Copper compounds except the halides, and when not moistened with hydrochloric acid.

Pure Green.—Compounds of thallium and tellurium.

Yellowish.—Barium compounds. Some molybdenum compounds. Borates, especially when treated with sulphuric acid or when burned with alcohol.

Bluish.—Phosphates with sulphuric acid.

Feeble.—Antimony compounds. Ammonium compounds.

Whitish.—Zinc.

Reds

Carmine.—Lithium compounds. Violet through blue glass. Invisible through green glass. Masked by barium flame.

Scarlet.—Strontium compounds. Violet through blue glass. Yellowish through green glass. Masked by barium flame.

Yellowish.—Calcium compounds. Greenish through blue glass. Masked by barium flame.

Yellow

Yellow.—All sodium compounds. Invisible with blue glass.

Borax Beads

Abbreviations employed: s., saturated; s.s., supersaturated; n.s.; not saturated; h., hot; c., cold.

Beads of Microcosmic Salt NaNH₄HPO₄

Substance	Oxidizing flame	Reducing flame	Substance	Oxidizing flame	Reducing flame
Aluminum	Colorless (h.c., n.s.); opaque (s.s.)	Colorless; opaque (s.)	Aluminum	Colorless; opaque (s.)	Colorless; not clear (s.s.)
Antimony	Colorless; yellow or brownish (h., s.s.)	Gray and opaque	Antimony	Colorless (n.s.)	Gray and opaque
Barium	Colorless (n.s.)		Barium	Colorless; opaque (s.)	Colorless; not clear (s.s.)
Bismuth	Colorless; yellow or brownish (h., s.s.)	Gray and opaque	Bismuth	Colorless (n.s.)	Gray and opaque
Cadmium	Colorless	Gray and opaque	Cadmium	Colorless (n.s.)	Gray and opaque
Calcium	Colorless (n.s.)		Calcium	Colorless; opaque (s.)	Colorless; not clear (s.s.)
Cerium	Red (h.)	Colorless (h.c.)	Cerium	Yellow or brownish red (h., s.)	Colorless
Chromium	Green (c.)	Green	Chromium	Red (h., s.); green (c.)	Green (c.)
Cobalt	Blue (h.c.)	Blue (h.c.)	Cobalt	Blue (h.c.)	Blue (h.c.)
Copper	Green (h.); blue (c.)	Red (c.); opaque (s.s.); colorless (h.)	Copper	Blue (c.); green (h.)	Red and opaque (c.)
Iron	Yellow or brownish red (h., n.s.)	Green (s.s.)	Iron	Yellow or brown (h., s.)	Colorless; yellow or brownish (h.)
Lead	Colorless; yellow or brownish (h., s.s.)	Gray and opaque	Lead	Colorless (n.s.)	Gray and opaque
Magnesium	Colorless (n.s.)		Magnesium	Colorless; opaque (s.)	Colorless; not clear (s.s.)
Manganese	Violet (h.c.)	Colorless (h.c.)	Manganese	Violet (h.c.)	Colorless
Molybdenum	Colorless	Yellow or brown (h.)	Molybdenum	Colorless; green (h.)	Green (h.)
Nickel	Brown; red (c.)	Gray and opaque	Nickel	Yellow (c.); red (h., s.)	Yellow (c.); red (h.); gray and opaque
Silicon	Colorless (h.c.); opaque (s.s.)	Colorless; opaque (s.)	Silicon	(Swims undissolved)	(Swims undissolved)
Silver	Colorless (n.s.)	Gray and opaque	Silver		Gray and opaque
Strontium	Colorless (n.s.)		Strontium	Colorless; opaque (s.)	Colorless; not clear (s.s.)
Tin	Colorless (h.c.); opaque (s.s.)	Colorless; opaque (s.)	Tin	Colorless; opaque (s.)	Colorless
Titanium	Colorless	Yellow (h.); violet (c.)	Titanium	Colorless (n.s.)	Violet (c.); yellow or brownish (h.)
Tungsten	Colorless	Brown			Green (h.)
Uranium	Yellow or brownish (h., n.s.)	Green	Uranium	Green; yellow or brownish (h., s.)	
Vanadium	Colorless	Green	Vanadium	Yellow	Green
			Zinc	Colorless (n.s.)	Gray and opaque

Sodium Carbonate Bead

Substance	Oxidizing flame	Reducing flame
Manganese	Green	Colorless