Flame Test Colors

Li^+	Deep red (crimson)
Na^+	Yellow
K^+	Violet
Ca^{2+}	Orange-red
Sr^{2+}	Red
Ba^{2+}	Green
Cu^{2+}	Blue-green

Aqueous Ion Colors

Cu^{1+}	Green
Cu^{2+}	Blue
Fe	Yellow to red-orange (depending on anion and charge of Fe); in rare cases, can form complex ion with a deep blue color
Fe^{2+}	yellow-green (depending on the anion)
Fe^{3+}	orange-red (depending on the anion)
Co^{2+}	Pink
Cr^{3+}	Violet ($Cr(NO_3)_3$ to Green ($CrCl_3$)
Ni^{2+}	Green
Mn^{2+}	Pink
Pb^{3+}	blue-green (Pb^{2+} and Pb^{4+} are colorless)
V^{2+}	violet
V^{3+}	blue-green
MnO_4^-	Purple (Mn w/ +7 oxidation state is purple)
CrO_4^{2-}	Yellow
$Cr_2O_7^{2-}$	Orange
$Cu(NH_3)_4^{2+}$	Dark Blue; produced when ammonia is added to Cu^{2+} solutions
$FeSCN^{2+}$	Red-brown, Wine-red to dark orange
$CoCl_4^{2-}$	Blue (Co^{2+} with HCl will form a $CoCl_4^{2-}$ complex that is blue)
$Ti(H_2O)_6^{3+}$	Purple

- Al, K, Li, Mg, Na, Ca, Ba, Sr, Zn are colorless aqueous ions and most of their solid salts are white.
- Transition element ions with partially filled *d* orbitals tend to release colored light.

Assorted Compounds

F_2	Pale-yellow gas
Cl_2	Green-yellow gas
Br_2	Red-brown liquid
I_2	Dark-violet vapor & dark metallic looking solid
S_8	Yellow, odorous solid
NO	Colorless gas; associated with reactions between metals and dilute HNO_3
NO_2	Brown gas; associated with reactions between metals and concentrated HNO_3
PbI_2	Bright yellow precipitate
Metallic sulfides	Sulfides of transition metals tend to be black
Fe_2O_3	Reddish brown (rust)
Metallic oxides	Oxides of colored transition metal ions tend to be colored

Acid-Base Indicators

Phenolphthalein	Colorless (pH<7) to Pink (pH>8 ; when OH^- is present)
Red Litmus (paper)	Turns purple in alkaline solution
Blue Litmus (paper)	Turns pink in acidic solution

Courtesy Scott Halander
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