

Qualitative Factoids

This document has its roots in the old exam (prior to 2014) and as such may be somewhat dated. There was a time on the AP exam when you could expect to see questions that related to colors and other qualitative tests. Since the current trend in education is to move away from the accumulation of knowledge, it is my suspicion that this list will become increasing *less* relevant to the exam in 2014 and beyond. Either way this *not* an exhaustive list, but it does cover a lot of what might have commonly come up on a typical AP exam in the past.

Flame test colors

Ion	Flame color
Li^+ , Sr^{2+} , Ca^{2+}	Red (various shades)
Na^+	Yellow/Orange
K^+	Lilac
Ba^{2+}	Green
Cu^{2+}	Blue-green

Transition metal ion colors

	+1	+2	+3	+4	+5	+6	+7
Sc			Colorless				
Ti			Violet	Colorless			
V		Violet	Green	Blue	yellow		
Cr		Blue	Green			Yellow (CrO_4^{2-})	Orange ($\text{Cr}_2\text{O}_7^{2-}$)
Mn		Pale pink		Brown		Dark Green	Purple
Fe		Pale green	Yellow/Brown				
Co		Pink	Orange/Yellow				
Ni		Green					
Cu	Colorless	Blue					
Zn		Colorless					

Common precipitate colors

WHITE	BLUE	YELLOW	BLACK	GREEN	RED/BROWN
AgCl	Many copper (II) ppt's.	AgI & PbI ₂	Many Sulfides	Many Fe(II) ppt's.	Many Fe(III) ppt's.
BaSO ₄					
PbCl ₂					
Many non-transition metal carbonates, hydroxides and sulfates					

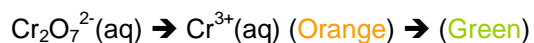
Common tests for gases

Gas	Test
Hydrogen	Squeaky pop with lighted splint
Oxygen	Re-lights glowing splint
Carbon Dioxide	Turns limewater milky
Ammonia	Pungent odor, turns red litmus paper blue, gives dense white fumes in contact with conc. HCl fumes

Common tests for cations and anions

Ion	Test
Carbonate and Hydrogen carbonate	Release CO ₂ gas with acids
Sulfate	White ppt. of BaSO ₄ with barium ions
Chloride	White ppt of AgCl with silver ions
Bromide	Cream ppt. of AgBr with silver ions
Iodide	Yellow ppt. of AgI with silver ions
Ammonium	NH ₃ released with hydroxide ions

Color changes in REDOX reactions



Acid/Base indicator color changes

	ACID	BASE
Methyl orange	Red	Yellow
Methyl red	Red	Yellow
Litmus	Red	Blue
Universal	Red	Blue/Purple
Phenolphthalein	Colorless	Pink

Miscellaneous other "color data"

HALOGENS: Fluorine gas – pale yellow/green, Chlorine gas – green, Bromine liquid – orange/brown, Iodine solid – dark purple

NO₂ gas – orange/brown

