

Individual Solid Nonmetal analysis

Many chemicals come in the form of powders or crystals. At first quick glance, it may look like they all look rather similar. But a closer look will show you that there are some major differences right off. We are going to look at 13 different solid nonmetal substances. We will learn how to identify them individually and then we will look at how to identify some of them when they are mixed together. As with the liquids and the metals, the identification will be on the basis of how the materials look, smell, their pH when mixed with water and if/how they dissolve or react with water, acid and iodine.

The first thing you need to observe is whether the solid is a powder, crystal, or granule. This will be done by looking at the substance with a magnifying glass. As with the liquids and metals, the ID material will be given to you in both a table and decision chart. You will be expected to record your own observations on the individual solid nonmetals. We will be using a wooden splint to take small amounts of the substances and putting in the wells of a "spot plate". While they are in the spot plate, you can test them for how they react with water, acid, iodine, etc. But of course you will not want to add more than one reagent to the solid at a time. Therefore you will need to keep cleaning the spot plate between each set of trials. You have a jar at your desk that you should use your wash bottle to wash the residue in the spot plate after each set of tests into.

Substance	Shape & Size	pH	Solubility in water	Reaction to HCl	Reaction to I ₂	Other Observations
Alka-Seltzer	Powder	~6	Fizzes	Fizzes	Stains pale yellow	Crumbles
Baking Soda	Powder	~8	Soluble	Fizzes	Stains pale yellow	
Calcium Carbonate	Powder	~6	Insoluble see end	Fizzes	Stains pale yellow	May appear to dissolve, but settles
Cornstarch	Powder	~8	Soluble-smooth	No Reaction	Turns blue	
Flour	Powder	~6	Soluble-lumpy	No Reaction	Turns blue	
Gelatin	Crystal	~6	Soluble-jelly like	No reaction	Stains pale yellow	Pale Yellowish cast
Gypsum	Powder	~6	Soluble-w/bubbles	No reaction	Stains pale yellow	
Salt	Uniform cubes	~7	Soluble	No Reaction	Stains pale yellow	
Sand	Irregular shape	~6	Insoluble	No Reaction	Stains pale yellow	Will not crumble
Sodium Acetate	Irregular Shape	~8	Soluble	No Reaction	Stains pale yellow	Crystals almost clear
Sugar	Irregular Size	~7	Soluble	No Reaction	Stains pale yellow	
Vitamin C	Irregular Size	~2	Soluble	No Reaction	Turns I ₂ clear	Crumbles-Yellowish
Yeast	Granular	~7	Soluble but delay	No Reaction	Stains pale yellow	Tarnish cloudy water

Or another way to look at the problem is with a decision chart. For nonmetal solids the chart would look like this:

