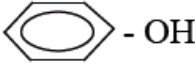
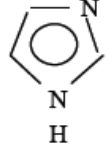
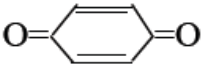


Soil organic Matter

One of the most important soil properties that influence the transport of hazardous compounds is naturally occurring organic matter. Soil organic matter may be divided into two classes: humic and nonhumic materials. Nonhumic chemicals are unaltered amino acids, carbohydrates, fats, and other biochemical that occur in the soil as a result of the presence of living organisms. Humic materials are yellow to dark brown polymers formed by microbial mediated. This materials, also called humus, is the nearly thermodynamically stable and originates from the carbon of plant, animals, and microorganisms. Humus typically contains polymerized phenols with accompanying carboxylic, carbonyl, eater, and methoxy groups, and nitrogen as shown below.

Function Groups on SOM

Important Functional Groups in Humic Substances

Amino	$R - NH_2$	Ether	$R-CH_2-O-CH_2-R'$
Amide	$R - \overset{\overset{O}{ }}{C} - NH_2$	Ester	$R-C-O-R'$
Amine	$R - CH_2NH_2$	Alcoholic OH	$R-OH$
Aldehyde	$R-HC = OH$	Phenolic OH	
Carbonyl	$R - \overset{\overset{O}{ }}{C} - R'$	Imidazole	
Carboxyl	$R - \overset{\overset{O}{ }}{C} - OH$	Quinone	
Enol	$R - \overset{\overset{O}{ }}{C} = CH - OH$		

2. Electrostatic Charges on Soil Colloids

Two major sources of charges on soil colloids:

1- hydroxyls and other functional groups;

1- the charge imbalance caused by the **isomorphous substitution** in some clay crystal structures.

In mineralogy, the process by which one element fills a structural position “usually” filled by another of similar size is called isomorphous substitution.

