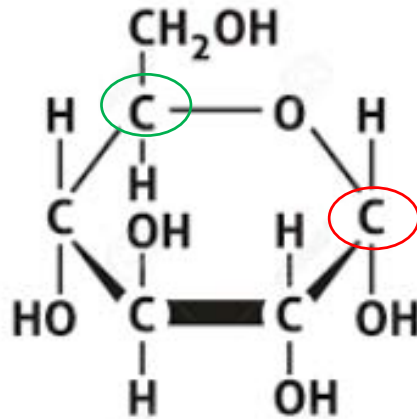
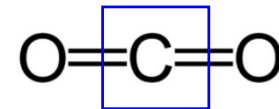


# Calculating Oxidation States

GLUCOSE MOLECULE



oxidation



- Individual C atoms have different oxidation states in glucose.
- However, the average C oxidation state in glucose molecule ( $C_6H_{12}O_6$ ) is ZERO
- C atom has a +IV oxidation state in carbon dioxide.

Img Source: <https://www.storyjumper.com/book/index/26677438/The-journey-of-Glycolysis-molecule>  
<https://www.scientificamerican.com/sciam/cache/file/9B1E1977-3A5E-4A78-8E0CF9BB7B9B89BE.jpg?w=590&h=393&E03C4B9F-607B-4A0D-9A2409FCB7DC3D78>

# Pauling's Electronegativity Scale

**Table 2.3** Electronegativities of Atoms According to the Scale Devised by Pauling (1960)

Charge of Kernel:	+ 1	+ 4	+ 5	+ 6	+ 7	
	H 2.2					Increasing Size of Kernel
		C 2.5	N 3.0	O 3.5	F 4.0	
			P 2.2	S 2.5	Cl 3.0	
					Br 2.8	
					I 2.5	

Source: Environmental Organic Chemistry, Schwarzenbach et al., 2003

# General Solubility Rules for Inorganic Compounds

Ion	Characteristic Solubility of Compounds Containing Ion
Nitrate, $\text{NO}_3^-$	All nitrates are soluble.
Chloride, $\text{Cl}^-$	All chlorides are soluble except $\text{AgCl}$ , $\text{PbCl}_2$ , and $\text{Hg}_2\text{Cl}_2$ .
Sulfate, $\text{SO}_4^{2-}$	Sulfates are soluble, except $\text{BaSO}_4$ and $\text{PbSO}_4$ ; $\text{Ag}_2\text{SO}_4$ , $\text{CaSO}_4$ , and $\text{Hg}_2\text{SO}_4$ are only slightly soluble.
Carbonate, $\text{CO}_3^-$ ; phosphate, $\text{PO}_4^{3-}$ ; silicate, $\text{SiO}_4^{4-}$	Carbonates, phosphates, and silicates are insoluble, except those of sodium, potassium, and ammonium.
Hydroxide, $\text{OH}^-$	Most hydroxides are insoluble. Exceptions include $\text{LiOH}$ , $\text{NaOH}$ , $\text{KOH}$ , and $\text{NH}_4\text{OH}$ (soluble); $\text{Ba}(\text{OH})_2$ (moderately soluble); and $\text{Ca}(\text{OH})_2$ and $\text{Sr}(\text{OH})_2$ (slightly soluble).
Sulfide, $\text{S}^{2-}$	All sulfides are insoluble, with the exception of alkali metal sulfides ( $\text{Na}_2\text{S}$ , $\text{K}_2\text{S}$ , etc.), $(\text{NH}_4)_2\text{S}$ , $\text{MgS}$ , $\text{CaS}$ , and $\text{BaS}$ .
Sodium, $\text{Na}^+$ ; potassium, $\text{K}^+$ ; ammonium, $\text{NH}_4^+$	All sodium, potassium, and ammonium compounds are soluble, with the exception of a few compounds that contain these ions along with a heavy metal (for example, $\text{K}_2\text{PtCl}_6$ ).

<sup>1</sup> Based on Dean, J. A., *Lange's Handbook of Chemistry*, 14th ed., McGraw-Hill, 1992.