

18<sup>th</sup> and 19<sup>th</sup> century atomic mass standards (standards)  
 Why did the atomic mass standards change from H to O & then to C?

1<sup>st</sup> standard (upto 1850) (Dalton, Cannizzaro)  
 $H = 1.000 \text{ amu}$   
 $\text{Atomic mass} = \frac{\text{mass of element}}{\text{mass of H}}$   
 Example:  $O = 15.87 \text{ amu}$ ,  $C = 12.02 \text{ amu}$

1850 Berzelius  
 $O = 16.000 \text{ amu}$   
 $\text{Atomic mass} = \frac{\text{mass of element}}{\text{mass of O}}$   
 Example:  $H = 1.000 \text{ amu}$ ,  $C = 12.000 \text{ amu}$

1919 Physical & Chemical standard  
 $^{16}O = 16.000 \text{ amu}$   
 $^{17}O = 17.000 \text{ amu}$   
 $^{18}O = 18.000 \text{ amu}$   
 Chemical standard:  $O = 16.000 \text{ amu}$   
 Physical standard:  $O-16 \text{ isotope}$

1919 Mass spectrometer (Astoria)  
 Physical & Chemical atomic masses  
 $1 \text{ amu} = 1.660539 \times 10^{-27} \text{ kg}$

1956 Alfred Nier & A. Olander  
 $C-12 = 12.000000 \text{ amu}$   
 Mass spectrometer  
 $1 \text{ amu} = 1.660539 \times 10^{-27} \text{ kg}$

• ජර්මානුක E. Weicher ක් ප්‍රයත්නයෙන්  
 1961 ට ~~IUPAP~~ <sup>IUPAP</sup> & IUPAC ප්‍රයත්න  
 වූවාහො හේතු 6 ලෙසින් C-12 ට  
 ස්ථාවර මූලාශ්‍රයක් තිබේ.

• 1961 ට - Carbon standard of <sup>පමාන</sup> ~~පමාන~~  
~~පමාන~~ (Universal atomic mass unit - u)  
~~පමාන~~ ~~පමාන~~ ~~පමාන~~ ~~පමාන~~

ආ.  $\frac{1}{12} = \frac{\text{පමාන C-12}}{12 \times \frac{1}{12}}$

$C = 12.000 \text{ u/Da}$       $H = 1.0078 \text{ u}$

$O-16 = 15.99491 \text{ u}$  ,  $O-17 = 16.99913 \text{ u}$   
 $O-18 = 17.99916 \text{ u}$