

# Introduction to Biology. Lecture 4

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- 1 Where we are?
  - Very basics of chemistry
- 2 Origin of Earth
  - Basics of chemistry



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# Where we are?

## Very basics of chemistry



# Very basics of chemistry

- **Atoms**
  - **Protons**
  - **Neutrons**
  - **Electrons**
- Atomic weight
- Isotopes
- Elements and periodic table
- Chemical bonds
- Valence and group
- Molecules
- Molecular weight



# Origin of Earth

## Basics of chemistry



1 IA																										18 VIIIA									
1	1.0079															2	4.0026																		
1	H															He																			
Hydrogen															Helium																				
3	6.941		9.0122													5	10.811	6	12.011	7	14.007	8	15.999	9	18.998	10	20.180								
2	Li	Be														B	C	N	O	F	Ne														
Lithium	Beryllium														Boron	Carbon	Nitrogen	Oxygen	Fluorine	Neon															
11	22.990		24.305													13	26.982	14	28.086	15	30.974	16	32.065	17	35.453	18	39.948								
3	Na	Mg											Al	Si	P	S	Cl	Ar																	
Sodium	Magnesium											Aluminium	Silicon	Phosphorus	Sulphur	Chlorine	Argon																		
19	39.098		20	40.078		21	44.956	22	47.867	23	50.942	24	51.996	25	54.938	26	55.845	27	58.933	28	58.663	29	63.546	30	65.39										
4	K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr																	
Potassium	Calcium	Scandium	Titanium	Vanadium	Chromium	Manganese	Iron	Cobalt	Nickel	Copper	Zinc	Gallium	Germanium	Arsenic	Selenium	Bromine	Krypton																		
37	57-80	38	87.62	39	88.906	40	91.224	41	92.906	42	95.94	43	98.906	44	101.07	45	102.91	46	106.42	47	107.87	48	112.41	49	114.82	50	118.71	51	121.76	52	127.6	53	126.9	54	131.29
5	Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe																	
Rubidium	Strontium	Yttrium	Zirconium	Niobium	Molybdenum	Technetium	Ruthenium	Rhodium	Palladium	Silver	Cadmium	Indium	Tin	Antimony	Tellurium	Iodine	Xenon																		
55	132.91	56	137.33	57-71	72	178.49	73	180.95	74	183.84	75	186.21	76	190.23	77	192.22	78	195.08	79	196.97	80	200.59	81	204.38	82	207.2	83	208.98	84	209	85	210	86	222	
6	Cs	Ba	Lanthanide	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn																	
Caesium	Barium	Lanthanide	Hafnium	Tantalum	Tungsten	Rhenium	Osmium	Iridium	Platinum	Gold	Mercury	Thallium	Lead	Bismuth	Polonium	Astatine	Radon																		
87	223	88	226	89-103	104	261	105	262	106	266	107	264	108	277	109	268	110	281	111	280	112	285	113	286	114	289	115	289	116	293	117	294	118	294	
7	Fr	Ra	Actinide	Rf	Db	Sg	Bh	Hs	Mt	Ds	Rg	Cn	Nh	Fl	Mc	Lv	Ts	Og																	
Francium	Radium	Actinide	Rutherfordium	Dubnium	Seaborgium	Bohrium	Hassium	Meitnerium	Darmstadtium	Roentgenium	Copernicium	Nihonium	Flerovium	Moscovium	Livermorium	Tennessine	Oganesson																		
57	138.91	58	140.12	59	140.91	60	144.24	61	145	62	150.36	63	151.96	64	157.25	65	158.93	66	162.50	67	164.93	68	167.26	69	168.93	70	173.04	71	174.97						
Lanthanum	Cerium	Praseodymium	Neodymium	Promethium	Samarium	Europium	Gadolinium	Terbium	Dysprosium	Holmium	Erbium	Thulium	Ytterbium	Lutetium																					
89	227	90	232.04	91	231.04	92	238.03	93	237	94	244	95	243	96	247	97	247	98	251	99	252	100	257	101	258	102	259	103	262						
Actinium	Thorium	Protactinium	Uranium	Neptunium	Plutonium	Americium	Curium	Berkelium	Californium	Einsteinium	Fermium	Mendelevium	Nobelium	Lawrencium																					

- Alkali Metal
- Alkaline Earth Metal
- Metal
- Metalloid
- Non-metal
- Halogen
- Noble Gas
- Lanthanide/Actinide

Z	mass
Smb	man-made
Name	



# Summary

- If the atomic weight in periodic table is not even, then two or more isotopes exist
- Most frequent isotope is typically the round atomic weight
- Difference between table atom weight (average) and most frequent isotope weight (rounded) hint to what are other isotopes





# For Further Reading



Isotope. Wikipedia.

<http://en.wikipedia.org/wiki/Isotope>

