



Kimia Unsur *Chemical Elements*

Meeting – 11
Every Thursday
at 7 – 9.30 am

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2016**

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Tentative Schedule: Tentative lecture topic coverage, subject to change.

Meeting	Date	Topic
9	25-10-2016	Refresh: Studium General "Chemistry in Context"
10	03-11-2016	Introduction, Hydrogen
	10-11-2016	
11	17-11-2016	Group 1A, IIA (1,2)
12	24-11-2016	Group IIIA, IVA (13,14)
13	01-12-2016	Group VA, VIA (15,16)
14	08-12-2016	Group VIIA, VIIIA (17,18)
15	15-12-2016	Group IB,IIB, IIIB (3,11,12)
16	22-12-2016	Group IVB, VB, VIB (4,5,6)
17	29-12-2016	Group VIIB-VIIIB (7,8,9,10)
18	05-01-2017	Final Exam

Periodic table of elements

IUPAC Periodic Table of the Elements

1 H hydrogen [1.007, 1.009]	2 He helium 4.003																		
3 Li lithium [6.938, 6.997]	4 Be beryllium 9.012																	10 Ne neon 20.18	
11 Na sodium 22.99	12 Mg magnesium [24.30, 24.31]																	18 Ar argon 39.95	
19 K potassium 39.10	20 Ca calcium 40.08	21 Sc scandium 44.96	22 Ti titanium 47.87	23 V vanadium 50.94	24 Cr chromium 52.00	25 Mn manganese 54.94	26 Fe iron 55.85	27 Co cobalt 58.93	28 Ni nickel 58.69	29 Cu copper 63.55	30 Zn zinc 65.38(2)	31 Ga gallium 69.72	32 Ge germanium 72.63	33 As arsenic 74.92	34 Se selenium 78.97	35 Br bromine [79.90, 79.91]	36 Kr krypton 83.80		
37 Rb rubidium 85.47	38 Sr strontium 87.62	39 Y yttrium 88.91	40 Zr zirconium 91.22	41 Nb niobium 92.91	42 Mo molybdenum 95.95	43 Tc technetium	44 Ru ruthenium 101.1	45 Rh rhodium 102.9	46 Pd palladium 106.4	47 Ag silver 107.9	48 Cd cadmium 112.4	49 In indium 114.8	50 Sn tin 118.7	51 Sb antimony 121.8	52 Te tellurium 127.6	53 I iodine 126.9	54 Xe xenon 131.3		
55 Cs caesium 132.9	56 Ba barium 137.3	57-71 lanthanoids	72 Hf hafnium 178.5	73 Ta tantalum 180.9	74 W tungsten 183.8	75 Re rhenium 186.2	76 Os osmium 190.2	77 Ir iridium 192.2	78 Pt platinum 195.1	79 Au gold 197.0	80 Hg mercury 200.6	81 Tl thallium [204.3, 204.4]	82 Pb lead 207.2	83 Bi bismuth 209.0	84 Po polonium	85 At astatine	86 Rn radon		
87 Fr francium	88 Ra radium	89-103 actinoids	104 Rf rutherfordium	105 Db dubnium	106 Sg seaborgium	107 Bh bohrium	108 Hs hassium	109 Mt meitnerium	110 Ds darmstadtium	111 Rg roentgenium	112 Cn copernicium	113 Uut ununtrium	114 Fl flerovium	115 Uup ununpentium	116 Lv livermorium	117 Uus ununseptium	118 Uuo ununoctium		

57 La lanthanum 138.9	58 Ce cerium 140.1	59 Pr praseodymium 140.9	60 Nd neodymium 144.2	61 Pm promethium	62 Sm samarium 150.4	63 Eu europium 152.0	64 Gd gadolinium 157.3	65 Tb terbium 158.9	66 Dy dysprosium 162.5	67 Ho holmium 164.9	68 Er erbium 167.3	69 Tm thulium 168.9	70 Yb ytterbium 173.0	71 Lu lutetium 175.0
89 Ac actinium	90 Th thorium 232.0	91 Pa protactinium 231.0	92 U uranium 238.0	93 Np neptunium	94 Pu plutonium	95 Am americium	96 Cm curium	97 Bk berkelium	98 Cf californium	99 Es einsteinium	100 Fm fermium	101 Md mendelevium	102 No nobelium	103 Lr lawrencium



For notes and updates to this table, see www.iupac.org. This version is dated 8 January 2016.
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Discussion

- Which hydrogen bond would you expect to be stronger, S-H.....O or O-H.....S?
- Describe the expected physical properties of water in the absence of hydrogen bonding.

IUPAC def (2011)

- The hydrogen bond is an attractive interaction between a hydrogen atom from a molecule or a molecular fragment X–H in which X is more electronegative than H, and an atom or a group of atoms in the same or a different molecule, in which there is evidence of bond formation.^[6]

Result of Quiz 1

- A : All three problems are correct 0%
- B : two out of three problems are correct 20%
- C : one out of three problems is correct 55%
- D : 3 problems are incorrect 25%

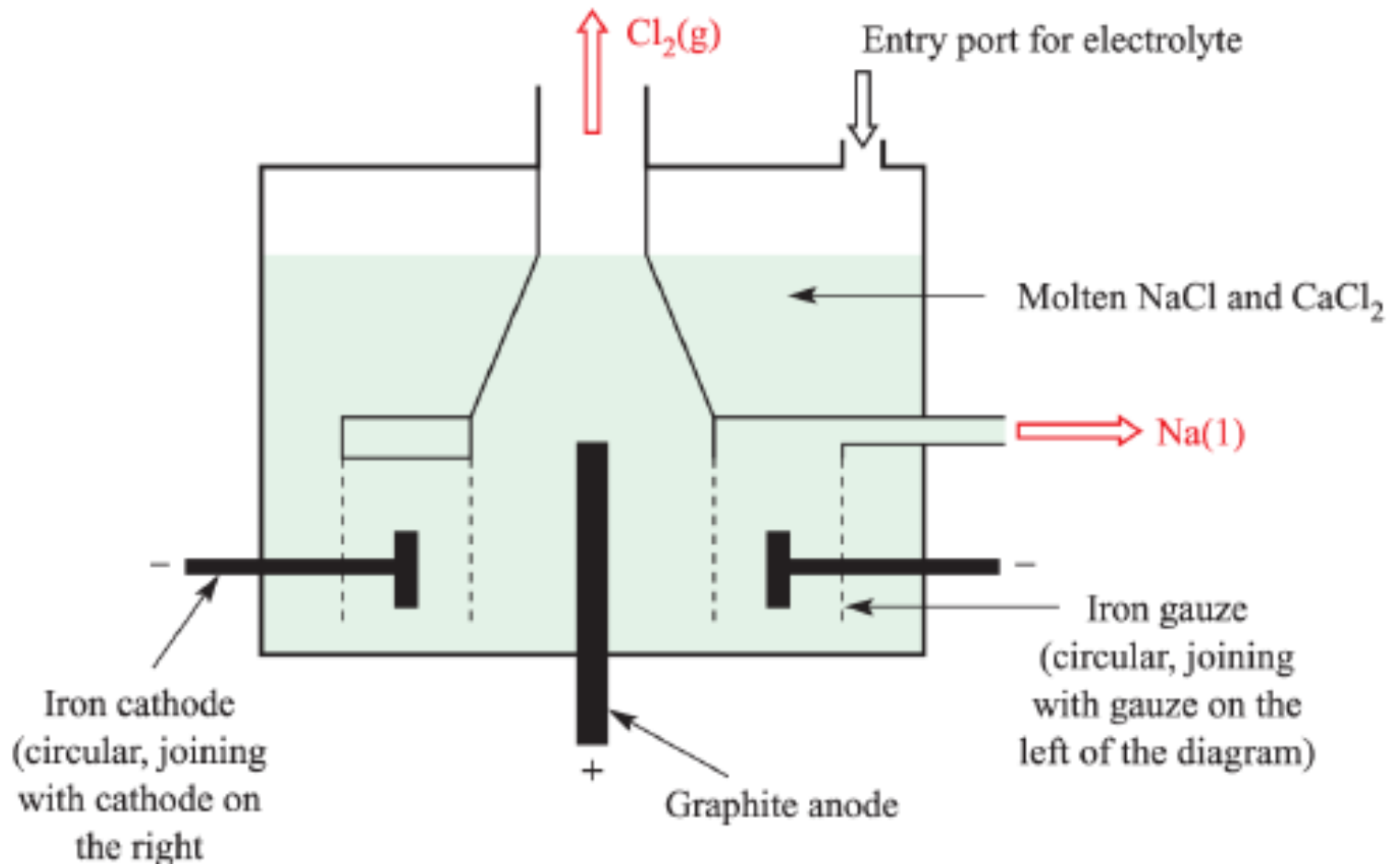
Evaluation

- 60% Exam and HW/Quiz
 - 40% Presentation task
-
- 40 % Final Exam
 - 20 % HW/Quiz
 - 10% Presentation
 - 10% content of the presentation
 - 10% participation
 - 10% Written Task

Lithium

- Reaction with alcohol
- It produces alkoxide
- $\text{Li} + \text{R-OH} \rightarrow \text{R-O-Li} + \text{H}_2$

Down's Process



Beryllium

(some anomalous behaviour?)

Because of small size and highest ionization energy and electronegativity

References

- Huheey et al., Inorganic Chemistry (book)
- Prakash et al., Advanced Inorganic Chemistry (book)
- Journal of Inorganic chemistry
- Journal of chemical education
- Download lecture materials:
- <http://nurma.staff.uns.ac.id>