

Coaching Report

Participant	Student Ljubljanski	Student detail	User_52
Group	ntc.at ats.at	Status	Ended normally
Assessment name	General Chemistry 2 - EN V4	Final Score	7
Time Used	00:11:18	Time limit (min)	60
Date taken	16-09-2016 09:59:00		

Questions - presented: 30, answered: 30

- 1** Metal M forms a chloride MCl_2 with a relative formula mass of 95. The chloride reacts with NaOH in aqueous solution affording a hydroxide precipitate. What is the formula mass of the hydroxide?



Question type	Multiple Choice
Topic	Chemistry of elements
Difficulty	2/3
Score	0
Score max	1
Answer choosen	40
Answer	<p>0) 58</p> <p>1) 24</p> <p>2) 40</p> <p>3) 41</p>

2 In the diagram below, which vertical distance represents the heat (enthalpy) of reaction ?



Question type	Multiple Choice
Topic	Energy
Difficulty	2/3
Score	0
Score max	1
Answer choosen	Z-W
Answer	0) W 1) X 2) Y 3) Z 4) Z-W

3 What is the amount of matter in 46ml of hydrogen (H₂)?
The molar volume of gas is 22l/mol.



Question type	Multiple Choice
Topic	States of matter
Difficulty	2/3
Score	0
Score max	1
Answer choosen	5.2 10 ⁻³ mol
Answer	0) 2.1 10 ⁻³ mol

1) $2.4 \cdot 10^{-3}$ mol

2) $4.6 \cdot 10^{-3}$ mol

3) $5.2 \cdot 10^{-3}$ mol

4) $1.0 \cdot 10^{-4}$ mol

4 The molar mass of copper (II) sulfate pentahydrate ($\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$) is

Relative atomic masses: H: 1.01 O: 16.00 S: 32.06 Cu: 63.55

Answer:



Question type

Numeric

Text

Topic

Chemical bonding

Difficulty

2/3

Score

0

Score max

1

Answer choosen

dye

Answer

0) 249.71

5 Calcium carbonate decomposes when heated with the production of carbon dioxide and calcium oxide. At equilibrium, in a closed system, at 800 C, $p_{\text{CO}_2} = 116$ kPa. $\text{CaCO}_3(\text{s}) \rightarrow \text{CaO}(\text{s}) + \text{CO}_2(\text{g})$ $\Delta H = 0$ kJ If the volume of the reaction vessel was 2.00 dm³, calculate the amount of CO_2 existing in equilibrium $R = 8.314 \text{ J mol}^{-1} \text{ K}^{-1}$



Question type

Numeric

Text

Topic

Chemical equilibria

Difficulty

2/3

Score	0
Score max	1
Answer choosen	not ok
Answer	0) 0.026

6 A solution containing 0.03 mol of Fe^{2+} ions is mixed with another solution containing 0.03 mol of hydroxide ions. A green precipitate of iron(II)hydroxide appears. Choose the most accurate statement.



Question type	Multiple Choice
Topic	Types of chemical reaction
Difficulty	2/3
Score	1
Score max	1
Answer choosen	All of the OH^- ions react.
Answer	<p>0) All of the OH^- ions react.</p> <p>1) Iron(II)hydroxide is soluble.</p> <p>2) This is a stoichiometric mixture.</p> <p>3) 0.03 mol of iron hydroxide is formed.</p> <p>4) All of Fe^{2+} ions disappear.</p>

7 The schemes X and Y represent, respectively, a lead rod dipped in a 1 mol/dm³ silver nitrate aqueous solution and a silver rod dipped in a 1 mol/dm³ lead(II) nitrate aqueous solution. $E^0(\text{Pb}^{2+} + 2e^- \rightarrow \text{Pb}) = -0.13\text{V}$; $E^0(\text{Ag}^+ + e^- \rightarrow \text{Ag}) = 0.80\text{V}$

Which of the sentences below describes correctly what happens in X and Y ?



Question type	Multiple Choice
Topic	Redox reactions
Difficulty	2/3
Score	0
Score max	1
Answer choosen	In X there is no alteration. In Y there is no alteration.
Answer	<p>0) In X there is no alteration. In Y there is lead deposition on the rod .</p> <p>1) In X there is no alteration. In Y there is no alteration.</p> <p>2) In X there is silver deposition on the rod. In Y there is no alteration.</p> <p>3) In X there is silver deposition on the rod. In Y there is lead deposition on the rod.</p>

8 Calculate how many ml of a 0.5mol/l FeSO₄ solution are necessary for the complete decolourisation of 850ml of a 0.2mol/l KMnO₄ solution under acidic conditions.

MnO₄⁻ + 5 Fe²⁺ + 8 H⁺ → Mn²⁺ + 5 Fe³⁺ + 4 H₂O Answer (ml):



Question type	Numeric
Text	
Topic	Acids and bases
Difficulty	2/3
Score	0
Score max	1

Answer choosen

not ok

Answer

0) 1700.0

9 Which statement is correct ?



Question type

Multiple Choice

Topic

Organic chemistry

Difficulty

2/3

Score

0

Score max

1

Answer choosen

1,2,3-Propanetriol is a toxic alcohol.

Answer

0) When an alkanoic (carboxylic) acid reacts with an alcohol water is formed.

1) Butanal is an isomer of butanol.

2) Acetaldehyde and acetone are isomers.

3) 1,2,3-Propanetriol is a toxic alcohol.

4) Benzyl alcohol and phenol are acids.

10 Find the correct formula for the ionic compound aluminium oxide: Periodic table groups: Al : III O : VI



Question type

Multiple Choice

Topic

Atomic structure

Difficulty

2/3

Score

0

Score max

1

Answer choosen

AlO

Answer

0) Al₂O₃

- 1) Al_2O
- 2) AlO_2
- 3) Al_3O_2
- 4) AlO

11 Which of the following gases has the lowest density at the same temperature and pressure?



Question type	Multiple Choice
Topic	States of matter
Difficulty	1/3
Score	1
Score max	1
Answer choosen	Hydrogen
Answer	0) Hydrogen 1) Carbon monoxide 2) Chlorine 3) Neon 4) Argon

12 The list below gives the names of different types of bonding that can be found in chemical substances. Select from the list the main type(s) of bonding present in: a piece of calcium carbonate



Question type	Multiple Response
Topic	Chemical bonding
Difficulty	1/3
Score	1

Score max	1
Answer choosen	Ionic bonding
	Covalent bonding
Answer	0) Covalent bonding
	1) Ionic bonding
	2) van der Waals bonding
	3) Hydrogen bonding
	4) Metallic bonding

13 A solution with pH 3 is diluted to 10 times its original volume and the pH of the diluted solution is 3.5. The initial solution is diluted with



Question type	Multiple Choice
Topic	Acids and bases
Difficulty	1/3
Score	0
Score max	1
Answer choosen	weak acid
Answer	0) weak acid
	1) strong monobasic acid
	2) strong dibasic acid
	3) sodium hydrogen carbonate
	4) distilled water

14 Indicate the particle in which nitrogen has the lowest oxidation number.



Question type	Multiple Choice
Topic	Redox reactions

Difficulty	1/3
Score	0
Score max	1
Answer choosen	NF3
Answer	0) N2O 1) NF3 2) HNO3 3) NH4+ 4) NO2-

15 A sample of ethane (C₂H₆) contains 2 x 10²² carbon atoms. How many hydrogen atoms does it contain ?



Question type	Multiple Choice
Topic	Atomic structure
Difficulty	1/3
Score	0
Score max	1
Answer choosen	2 x 10 ²²
Answer	0) 2 x 10 ²² 1) 3 x 10 ²² 2) 6 x 10 ²² 3) 12 x 10 ²² 4) 6 x 10 ²³

16 At a certain temperature, for the reaction: CO(g) + Cl₂(g) ⇌ COCl₂(g) the equilibrium partial pressures of carbon monoxide, chlorine, and carbonyl chloride are: 2, 4, and 48 bar respectively. What is the value of K_p ? 1 bar =

100000 Pa



Question type	Multiple Choice
Topic	Chemical equilibria
Difficulty	1/3
Score	0
Score max	1
Answer choosen	12 bar
Answer	0) 54 bar 1) 42 bar 2) 12 bar 3) 8 bar-1 4) 6 bar-1

17 Elements A and B have the atomic numbers 11 and 9 respectively. Select the right statements.



Question type	Multiple Response
Topic	Types of chemical reaction
Difficulty	1/3
Score	0
Score max	1
Answer choosen	A and B will form a compound A ₂ B ₃ .
Answer	0) A and B will form a compound AB. 1) The compound of A and B conducts electricity in its aqueous solutions. 2) A and B will form a compound A ₂ B ₃ .

3) The compound of A and B is covalent.

4) A and B cannot form a compound.

18 Answer this question by moving the pointer of your mouse to the diagram that best represents the relationship stated below. Relationship: The change in temperature (Y) with time (X) when a fixed mass of water is heated at a constant rate.



Question type	Hotspot
Topic	Energy
Difficulty	1/3
Score	1
Score max	1
Answer choosen	not ok
Answer	0) 147,0,297,138

19 Choose structures that are isomers.



Question type	Multiple Response
Topic	Organic chemistry
Difficulty	1/3
Score	0
Score max	1
Answer choosen	CH ₃ -CH ₂ -CH=CH-CH ₃ CH ₃ -CH ₂ -CH(CH ₃)-CH ₃ CH ₃ -CH(CH ₃)-CH(CH ₃)-CH ₃ C(CH ₃) ₄
Answer	0) C ₅ H ₁₂

- 1) $\text{CH}_3\text{-CH}_2\text{-CH(CH}_3\text{)-CH}_3$
- 2) $\text{CH}_3\text{-CH}_2\text{-CH=CH-CH}_3$
- 3) $\text{C(CH}_3\text{)}_4$
- 4) $\text{CH}_3\text{-CH(CH}_3\text{)-CH(CH}_3\text{)-CH}_3$

20 The following is a schematic representation of the Periodic Table of chemical elements. The letters shown do not denote the chemical symbols of the elements. Use your computer mouse to move the marker to the letter in the Periodic Table that best represents the elements in the following question: which element occurs abundantly in the air, but does not support combustion ?



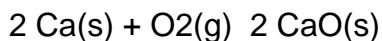
Question type	Hotspot
Topic	Chemistry of elements
Difficulty	1/3
Score	0
Score max	1
Answer choosen	not ok
Answer	0) 426,35,456,62

21 Which one of the following reactions is accompanied by an increase in entropy ?

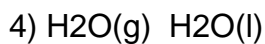
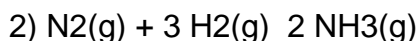
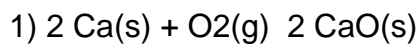
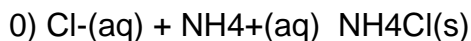


Question type	Multiple Choice
Topic	Chemical equilibria
Difficulty	3/3
Score	0
Score max	1

Answer choosen



Answer



22

When a mixture of hydrogen and chlorine are allowed to react in presence of light, there may be an explosion. The energy required to break the chlorine bond is 241kJ/mol. What is the longest wavelength of light that could initiate such a reaction?

Plancks constant: $h=6.62 \times 10^{-34}\text{Js}$;Avogadros constant: 6.023×10^{23} ;Speed of light: $3.00 \times 10^8\text{m/s}$.



Question type

Multiple Choice

Topic

Types of chemical reaction

Difficulty

3/3

Score

0

Score max

1

Answer choosen

0.1 nm

Answer

0) 0.1 nm

1) 0.05 nm

2) 500 nm

3) 1.0 nm

4) 0.05 mm

23

1 ... 3 ... 17 18 T U V W X Hypothetical elements T, U, V,

W and X are located in the upper half of the periodic table of elements shown

above. Elements T, U, V and W are all in the same period. Element X is in the same group (17) as element V and is immediately below it. Which of the following comparisons of elements T- V is correct ?



Question type	Multiple Choice
Topic	Atomic structure
Difficulty	3/3
Score	1
Score max	1
Answer choosen	V is more electronegative than T.
Answer	<p>0) V is more electronegative than T.</p> <p>1) V is more metallic than T.</p> <p>2) Atoms of V have fewer valence electrons than do those of T.</p> <p>3) Atoms of V have fewer electrons than do those of T.</p> <p>4) The usual valence (combining capacity) of V is greater than that of T.</p>

24 In a laboratory activity, a student burns 4.24g ethanol. The molar heat of combustion of ethanol is 1372kJ/mol. How much energy (kJ) is released?Answer (kJ):



Question type	Numeric
Text	
Topic	Energy
Difficulty	3/3

Score	0
Score max	1
Answer choosen	the Black Sea
Answer	0) 126.2

25 The pH value of a 10^{-3}mol/l solution of ethanoic acid is 3.9. The pK_a of the conjugate acid-base pair is 4.7. What is the degree of dissociation of CH_3COOH (ethanoic acid) molecules in 10^{-3}mol/l solution?



Question type	Multiple Choice
Topic	Acids and bases
Difficulty	3/3
Score	0
Score max	1
Answer choosen	4%
Answer	0) 12.6% 1) 1% 2) 4% 3) 83% 4) 16%

26 Which is an alkyne isomer of $\text{CH}_2=\text{CH}-\text{CH}=\text{CH}_2$?



Question type	Hotspot
Topic	Organic chemistry
Difficulty	3/3
Score	1
Score max	1

Answer choosen

not ok

Answer

0) 49,3,248,44

27 A saturated aqueous solution of cadmium hydroxide, $\text{Cd}(\text{OH})_2$, has $[\text{H}_3\text{O}^+] = 4.4 \times 10^{-10} \text{ mol/dm}^3$, at a temperature of 25C. Calculate the solubility product constant, K_s , for cadmium hydroxide at 25C.

Note: use notation 3.5E-12 for exponential number 3.5×10^{-12} Answer:



Question type

Numeric

Text

Topic

States of matter

Difficulty

3/3

Score

0

Score max

1

Answer choosen

a dark green material.

Answer

0) .00000000000000059

28 Iron which easily becomes rusty can be protected with



Question type

Multiple Response

Topic

Chemistry of elements

Difficulty

3/3

Score

0.6

Score max

1

Answer choosen

a metal that does not oxidize in the air

Zn

Answer

0) Fe

1) a metal that does not oxidize in the air

- 2) Zn
- 3) Mg
- 4) CaO

29 Which two statements are true



Question type	Multiple Response
Topic	Redox reactions
Difficulty	3/3
Score	0.5
Score max	1
Answer choosen	when an iron nail is left on the ground chemical corrosion takes place
Answer	0) when an iron nail is left on the ground chemical corrosion takes place 1) when an iron nail is left on the ground electrochemical corrosion takes place 2) in chemical corrosion a metal reacts with oxygen and water 3) in electrochemical corrosion electric current must be brought to the system 4) iron nails must be used in copper roofs

30 Which of the following compounds has the most pronounced ionic character

?



Question type	Multiple Choice
Topic	Chemical bonding

Difficulty	3/3
Score	0
Score max	1
Answer choosen	AlCl ₃
Answer	<div><div>0) NaCl</div><div>1) MgCl₂</div><div>2) AlCl₃</div><div>3) SiCl₄</div><div>4) PCl₃</div></div>