

The Open University of Sri Lanka

B.Sc. Degree Programme 2011/2012

Environmental Chemistry - CMU 3129 - Level 5

Assignment 1 Test



Date: 20.03.2012 (Tuesday)

Time: 4.00 p.m. – 5.30 p.m.

Registration Number:

Staff's signature:

Answer all the questions

1. a. (i) Define the terms

Source:.....
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Pollutant:.....
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Residence time:
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Steady state:
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(20 marks)

(ii) In the water cycle, the total mass of water at any time in the atmosphere is approximately 1.3×10^{16} kg. The inward flux is 4.23×10^{17} and 7.29×10^{16} kg y^{-1} by evaporation from oceans and land, respectively. The outward fluxes of 3.86×10^{17} and 1.10×10^{17} kg y^{-1} precipitation onto ocean and land. Calculate the residence time of water in the atmosphere.

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(20 marks)

b. Classify the following pollutants as primary pollutants and secondary pollutants.

- i. NO
- ii. NO₂
- iii. CO
- iv. O₃
- v. SO₂

(15 marks)

c. Give the functions of atmosphere

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(20 marks)

d. i. What is meant by Temperature inversion?

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ii. Briefly explain its adverse effects.

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(25 marks)

2.a. i. Construct the nitrogen cycle and label all the major process in it.

(50 marks)

ii. What is meant by

Nitrification:
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Denitrification:
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(20 marks)

b. i. Increased fossil fuel combustion leads to carbon dioxides and oxides of nitrogen and sulphur. What are the environmental effects of

Carbon dioxide:

Nitrogen dioxide:

Sulphur oxide:

(15 marks)

c. i. What do you mean by

UV - A radiation:

UV - B radiation:

UV - C radiation:

ii. What are the effects of UV radiation on human being?

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(15 marks)

3.a. Oxygen is an important element that exists in the Earth's atmosphere.

i. What are the source and sinks of molecular oxygen in the atmosphere?

Source:.....

Sinks:.....

ii. In the stratosphere, oxygen also exists as ozone, O₃. Write down the mechanism by which O₃ is formed in the stratosphere.

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iii. Briefly describe the important function played by O₃ in the stratosphere.

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iv. The O₃ is decomposed in the presence of NO. Write down the mechanism for this decomposition.

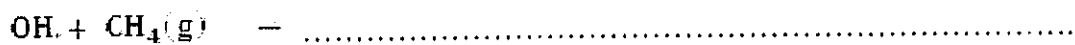
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(50 marks)

b. i. Give the sources of hydroxyl radical.

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ii. Hydroxyl radical OH , is an important trace component of the atmosphere, which participates in a number of atmospheric reactions. Complete the following reactions.



(30 marks)

c. i. Write balanced chemical equation to show how SO_2 contribute to acid rain.

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ii. What are environmental effects of acid rain?

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(20 marks)