

Entry Quiz

(multiple correct answers are possible!)

Fall 2006 *Global Biogeochemical Cycles Class*

1. Which elements that now comprise 99% of the universe were formed shortly after the “Big Bang”?

- carbon and oxygen
- hydrogen and helium
- helium and lithium
- hydrogen, carbon and nitrogen

2. What gas/gases in the atmosphere is/are a clear indication of life on earth?

- CO₂, carbon dioxide
- O₂, oxygen
- H₂O, water vapor
- CH₄, methane
- C₂H₄, ethene

3. Which of the following elements has no trace gas associated with it?

- | | |
|---|-----------------------------------|
| <input type="checkbox"/> phosphorous | <input type="checkbox"/> nitrogen |
| <input checked="" type="checkbox"/> iron | <input type="checkbox"/> iodine |
| <input checked="" type="checkbox"/> magnesium | <input type="checkbox"/> sulfur |
| <input type="checkbox"/> hydrogen | <input type="checkbox"/> bromine |

4. True or false: Photosynthesis produces O₂ from water during the uptake of the same amount of CO₂, and therefore oxygen in the atmosphere represents an equivalent amount to the biogenic carbon on earth.

- TRUE FALSE

5. Order the following (trace) gases by their increasing lifetime in the atmosphere:

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|--------------------|--------------------------------------|
| 5. methane | 6. nitrous oxide, N ₂ O |
| 3. carbon monoxide | 4. carbon dioxide |
| 2. sulfur dioxide | 1. isoprene (2-methyl-1,3-butadiene) |

6. Carbon monoxide is important in the atmosphere as it ...

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|---|---|
| <input checked="" type="checkbox"/> ... is poisonous to humans | <input type="checkbox"/> ... is poisonous to plants |
| <input type="checkbox"/> ... is a greenhouse gas | <input type="checkbox"/> ... consumes ozone |
| <input checked="" type="checkbox"/> ... affects the lifetime of other greenhouse gases | |
| <input checked="" type="checkbox"/> ... interacts with nitrogen oxides to produce ozone ("summer smog") | |

7. Ammonia (NH₃) is emitted into the atmosphere from ...

- | | |
|--|---|
| <input checked="" type="checkbox"/> ... plants | <input checked="" type="checkbox"/> ... soils |
| <input checked="" type="checkbox"/> ... fertilizer use | <input checked="" type="checkbox"/> ... animal manure |

8. True or false: The global consumption of beef since the turn of the last century has considerably contributed to the increase of methane in the atmosphere.

- | | |
|--|--------------------------------|
| <input checked="" type="checkbox"/> TRUE | <input type="checkbox"/> FALSE |
|--|--------------------------------|

9. Stratospheric clouds consisting of mostly H₂SO₄ derive most of their sulfur from tropospheric emissions of ...

- | | |
|--|---|
| <input type="checkbox"/> ... SO ₂ | <input type="checkbox"/> ... H ₂ S |
| <input type="checkbox"/> ... DMS (dimethylsulfide) | <input checked="" type="checkbox"/> ... COS |

10. Burning of biological material ("biomass burning") causes many trace gases and particles to be emitted into the atmosphere. Which of the following is NOT emitted:

- | | | |
|---|--|---|
| <input type="checkbox"/> CO | <input type="checkbox"/> soot | <input checked="" type="checkbox"/> BrCl |
| <input type="checkbox"/> N ₂ O | <input type="checkbox"/> CH ₄ | <input type="checkbox"/> NO |
| <input type="checkbox"/> CH ₃ Cl | <input type="checkbox"/> N ₂ | <input type="checkbox"/> hydrocarbons (such as propane) |