Advanced Pollution Science

Pollution Science · Answer Key · 10 Questions

1. Which specific atmospheric compound is primarily responsible for the depletion of the stratospheric ozone layer due to its high ozone depletion potential (ODP)?

A) Carbon tetrachloride

B) Dichlorodifluoromethane (CFC-12)

C) Sulfur hexafluoride

D) Perfluorocarbons

2. In the context of water pollution, what is the 'Redfield Ratio' used to determine when assessing nutrient limitation in marine ecosystems?

A) 106:16:1 C:N:P

B) 16:106:1 N:P:C

C) 1:16:106 P:N:C

D) 106:1:16 C:P:N

3. What is the primary mechanism by which polycyclic aromatic hydrocarbons (PAHs) exert mutagenic effects in biological organisms?

A) Competitive inhibition of ATP synthase

B) Metabolic activation to reactive diol epoxides that intercalate DNA

C) Chelation of essential trace metal ions

D) Disruption of the sodium-potassium pump

4. Which heavy metal, often associated with industrial smelting, is known to cause 'Itai-itai' disease through chronic ingestion of contaminated rice?

A) Mercury

B) Lead

C) Cadmium

D) Arsenic

5. The 'Minamata Convention' is an international treaty specifically designed to protect human health and the environment from anthropogenic emissions and releases of which substance?

A) Polychlorinated biphenyls

B) Mercury

C) Dioxins

D) Asbestos

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6. What is the chemical process known as 'nitrification' in soil pollution science, often leading to groundwater contamination?

A) The reduction of nitrate to nitrogen gas
B) The oxidation of ammonia to nitrite and then nitrate
C) The fixation of atmospheric nitrogen by rhizobia
D) The absorption of urea by soil colloids

7. Which term describes the increased concentration of a pollutant in the tissues of organisms at successively higher trophic levels of a food chain?

A) Bioconcentration
B) Bioaccumulation
C) Biomagnification
D) Biodegradation

8. What is the standard measurement unit used to define the 'Global Warming Potential' (GWP) of greenhouse gases relative to carbon dioxide?

A) Time-integrated radiative forcing
B) Molecular weight mass equivalence
C) Photochemical ozone creation potential
D) Biochemical oxygen demand

9. Which volatile organic compound (VOC) is specifically regulated in indoor air quality standards due to its prevalence in pressed-wood products and adhesives?

A) Benzene
B) Formaldehyde
C) Toluene
D) Xylene

10. Under the Stockholm Convention, which group of chemicals is classified as 'Persistent Organic Pollutants' (POPs) characterized by high lipid solubility?

A) Organophosphates
B) Organochlorines
C) Carbamates
D) Pyrethroids

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