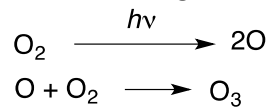


Where is ozone layer located in Earth's atmosphere?

- A. Troposphere B. **Stratosphere** C. Mesosphere D. Thermosphere

The highest level of ozone occurs in the stratosphere of Earth's atmosphere, which starts at about 10 to 18 km above the ground and ends at 50 km above the ground. Although the the average ozone concentration in this ozone layer is only 10 ppm, it is considerably high compared to the average ozone concentration in the entire atmosphere, which is about 0.3 ppm.

The ozone layer usually resides near the bottom of the stratosphere and is approximately 10-15 km above the ground. Ozone in the stratosphere is produced from photochemical reaction of O₂: the ultraviolet light strikes the O₂ molecules, which are in turn split into oxygen atoms. The produced oxygen atom subsequently reacts with another O₂ molecule to generate O₃.



Since ozone is a reactive molecule, it can break back down into O₂ and an oxygen atom, forming the ozone cycle.

The reason why ozone is mostly concentrated in the stratosphere is due to the stratification in stratosphere. In stratosphere, the atmospheric temperature goes up with altitude, which means that the hotter and lighter air stays on top of the stratosphere, and the colder and denser air stays on the bottom. The stratification ensures minimum convection and mixing, allowing for a stable environment for ozone. Conversely, the troposphere (the atmosphere we live in) has inverse relationship of temperature with altitude, generating a lot of convection. Therefore, it is not a stable environment to form a steady ozone layer.

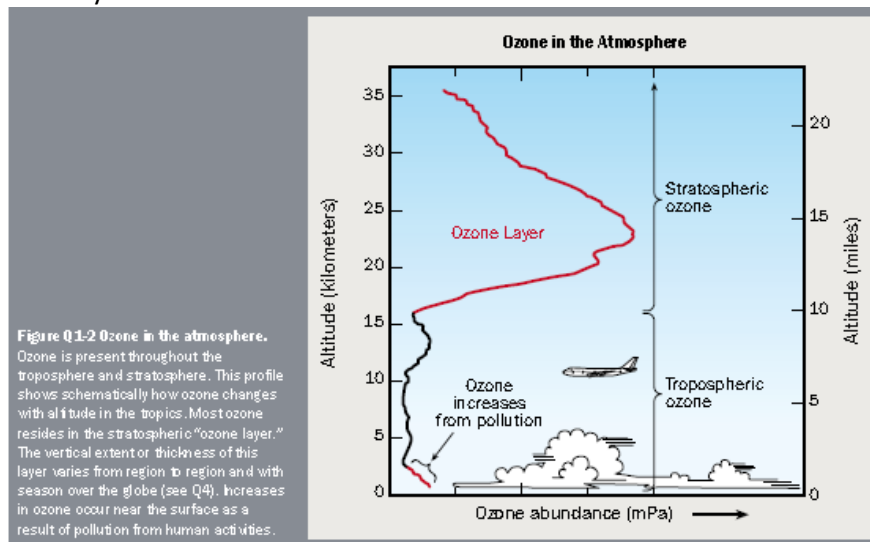


Fig.1 Ozone in the atmosphere

Reference:

<https://www.epa.gov/ozone-layer-protection/basic-ozone-layer-science>