

Characteristics of earth s atmosphere

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Earth's early atmosphere consisted of accreted gases from the solar nebula, but the atmosphere changed significantly over time, affected by many factors such as volcanism, impact events, weathering and the evolution of life (particularly the photoautotrophs). Recently, human activity has also contributed to atmospheric changes, such as climate change (mainly through deforestation and fossil fuel-related global warming), ozone depletion and acid deposition.

The study of Earth's atmosphere and its processes is called atmospheric science (aerology), and includes multiple subfields, such as climatology and atmospheric physics. Early pioneers in the field include Leon Teisserenc de Bort and Richard Assmann. The study of historic atmosphere is called paleoclimatology.

The average molecular weight of dry air, which can be used to calculate densities or to convert between mole fraction and mass fraction, is about 28.946; or 28.96; g/mol. This is decreased when the air is humid.

The exosphere is too far above Earth for meteorological phenomena to be possible. However, Earth's auroras--the aurora borealis (northern lights) and aurora australis (southern lights)--sometimes occur in the lower part of the exosphere, where they overlap into the thermosphere. The exosphere contains many of the artificial satellites that orbit Earth.

This layer is completely cloudless and free of water vapor. However, non-hydrometeorological phenomena such as the aurora borealis and aurora australis are occasionally seen in the thermosphere. The International Space Station orbits in this layer, between 350 and 420 km (220 and 260 mi). It is this layer where many of the satellites orbiting the Earth are present.

The mesosphere is the third highest layer of Earth's atmosphere, occupying the region above the stratosphere and below the thermosphere. It extends from the stratopause at an altitude of about 50 km (31 mi; 160,000 ft) to the mesopause at 80-85 km (50-53 mi; 260,000-280,000 ft) above sea level.

Temperatures drop with increasing altitude to the mesopause that marks the top of this middle layer of the atmosphere. It is the coldest place on Earth and has an average temperature around -85°C (-120°F; 190 K).

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Web: <https://hollanddutchtours.nl/contact-us/>

Email: energystorage2000@gmail.com

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