

Significance Of Atmospheric Methane As An Indicator For Life

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NASA's proposed Terrestrial Planet Finder (TPF) Mission is a space-based, infrared interferometer that will hopefully have the capability of taking spectra of extrasolar planet atmospheres. One possible bioindicator that has already received considerable attention is ozone, O_3 . O_3 is formed photochemically from O_2 , and most of Earth's O_2 is thought to have been produced by photosynthesis. O_2 , however, has probably only been abundant in Earth's atmosphere for about the last 2 billion years. For a billion and a half years prior to that, life was almost certainly present, but the atmosphere may have been reducing. One gas that may well have been present in high concentrations is methane, CH_4 . CH_4 has both biotic and abiotic sources, and it is necessary to understand these sources in order to predict whether or not methane is a reliable biological indicator. Preliminary calculations suggest that it may indeed be useful in this respect.