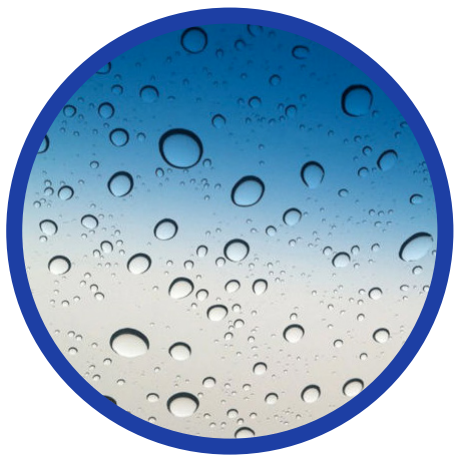
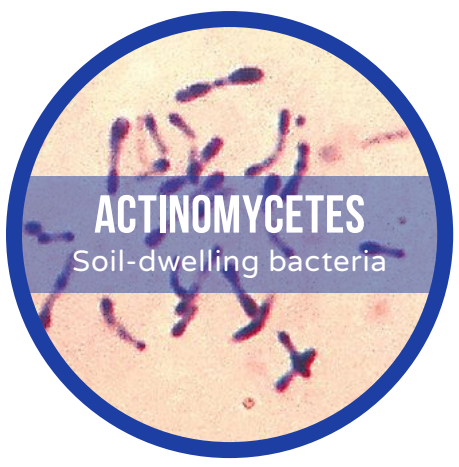
Aroma Chemistry

THE AROMA OF RAIN



The smell of rain, sometimes referred to as ‘petrichor’, has a number of contributors. Oils secreted by plants, compounds secreted by bacteria, and the splitting of atmospheric chemicals to form ozone can all play a part.

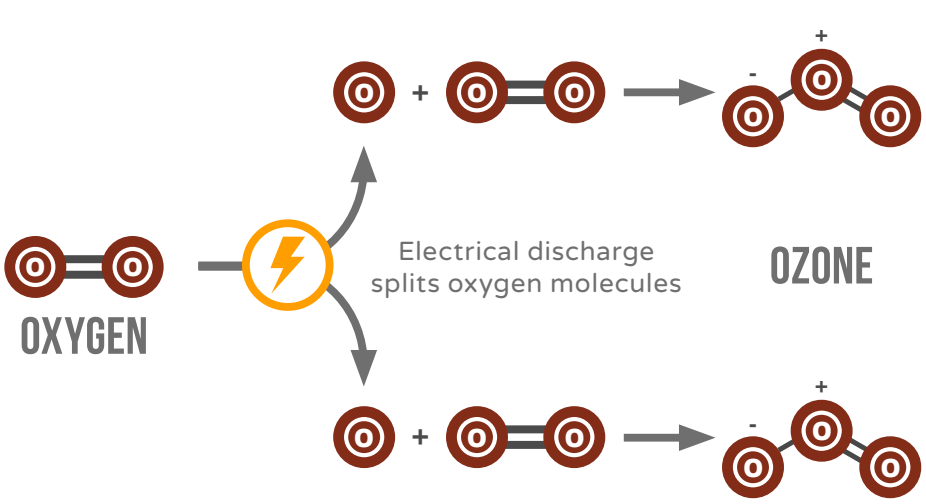


COMPOUNDS FROM BACTERIA

Actinomycetes, a group of soil-dwelling bacteria, secrete geosmin, which has an earthy aroma, when they produce spores. Rain disturbs the compound from the soil. Human noses can detect it at less than 5 parts per trillion - equivalent to a teaspoon in 200 Olympic swimming pools.

VOLATILE OILS FROM PLANTS

Plants secrete oils in dry periods, which accumulate in rocks & soil. Rain causes smaller, volatile compounds within them, likely created by oxidation of fats, to be released. The term ‘petrichor’ was coined in 1964 to refer to this smell. Scientists think the purpose of these compounds is to prohibit growth during dry periods and limit competition for water.



OZONE IN THE ATMOSPHERE

In stormy weather, electric discharges from lightning strikes can split diatomic oxygen in the air into individual oxygen atoms. These can then combine with other diatomic oxygen molecules to form ozone, which can be carried down from high altitudes by thunderstorms, giving rise to the ‘pre-rain’ smell.