

What is the piezoelectric effect?

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About the Piezoelectric effect?

- It is a phenomenon where specific types of material produce an **electric charge** proportional to the **mechanical stress applied to them**.
- It was first time discovered in 1880, in quartz.
- Quartz is the most famous piezoelectric crystal. Quartz is silicon dioxide (SiO_2).
 - The quartz crystal consists of **silicon and oxygen atoms** at the four vertices of a three-sided pyramid; each oxygen atom is shared by two pyramids. These pyramids repeat themselves to form the crystal.
 - When **mechanical stress is applied** – i.e., when the crystal is squeezed – the position of the charge is pushed further from the centre, giving rise to a small voltage. This is the source of the effect.
 - It is used in this capacity in analog wristwatches and clocks. Such crystals are also used in **cigarette lighters, electric guitars, TV remote controls**, audio **transducers**, and other instruments where converting mechanical stress to a current is useful.
- This effect has only been expected in solids thus far because the body being squeezed needs to have an organised structure, like pyramids of quartz.
- Liquids don't have such a structure. Instead, they take shape of their container.

Q1) What is Quartz?

Quartz is the most abundant and widely distributed mineral found at Earth's surface. It is present and plentiful in all parts of the world. It forms at all temperatures. It is abundant in igneous, metamorphic, and sedimentary rocks.

Source: [Scientists spot piezoelectric effect in liquids for the first time](#)

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