

Catalysis: some history

When is catalysis first mentioned? In what context?

The word *catalysis* was introduced by Jöns J. Berzelius in 1835 who first noted that certain chemicals speed up a reaction. He noticed that hydrogen burned rapidly in the presence of platinum and as the surface area of the platinum is increased its catalytic activity increases to a point where the hydrogen can ignite spontaneously.



Elizabeth Fulhame, the 18th century chemistry pioneer who faded from history



<https://www.chemistryworld.com/opinion/elizabeth-fulhame-the-18th-century-chemistry-pioneer-who-faded-from-history/4015638.article>

More than 200 years ago, a female chemist introduced the concept of catalysis and made early steps towards photography.

The discovery of catalysis is usually attributed to Swedish chemist Jons Jakob Berzelius in 1835. Although he named the phenomenon, the underlying principle was first described 40 years earlier by Elizabeth Fulhame, a Scottish chemist who remains largely uncelebrated for her remarkable experimentation and chemical theorizing. Historians Marelene and Geoffrey Rayner-Canham argue in their 1998 book *Women in Chemistry* that Fulhame was ‘the first solo woman researcher of modern chemistry’. She disagreed with many of the leading scientists of her time and with hindsight was very often on the right side of the scientific debate.

She proposed, and demonstrated through experiment, that many oxidation reactions occur only in the presence of water, that they directly involve water, and that water is regenerated and is detectable at the end of the reaction.

Challenges in catalysis today

Use of renewable starting materials, e.g. biodegradable polymers.

Enantioselective catalysis, 100% selectivity.

Catalysis in the energy domain, e.g. energy storage, H₂ production, or CO₂ utilization.

Conversion of any stoichiometric process into an atom economic process.