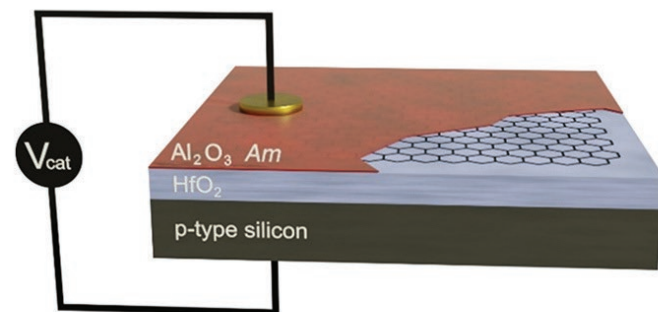


# Catalytic alchemy

Read the full article at [rsc.li/3Hn1BKv](https://rsc.li/3Hn1BKv)

Metal and metal oxide catalysts normally remain static and the same for months while reactions take place on their surfaces. The catalytic condenser can quickly change this property and make cheap and abundant metals act like more expensive ones by varying the applied voltage.

The new catalytic condenser has four layers: a silicon wafer, a thin electrically insulating hafnium oxide layer, a conductive graphene sheet and, finally, a film of alumina catalyst. By applying a voltage between the silicon and the graphene/catalyst layer, electrons accumulate on one side and holes accumulate on the other. When you get enough electrons or holes in the catalyst layer, the material can take on new catalytic properties.



Schematic of the device showing the alumina, graphene, hafnium oxide and silicon layers

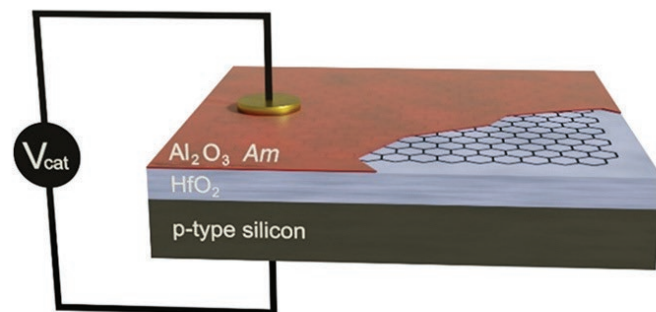
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1. What part of the Periodic table contains elements that often act as catalysts?
2. Catalysts are often described as specific. What does this mean?
3. Explain how the catalytic condenser could save money.



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