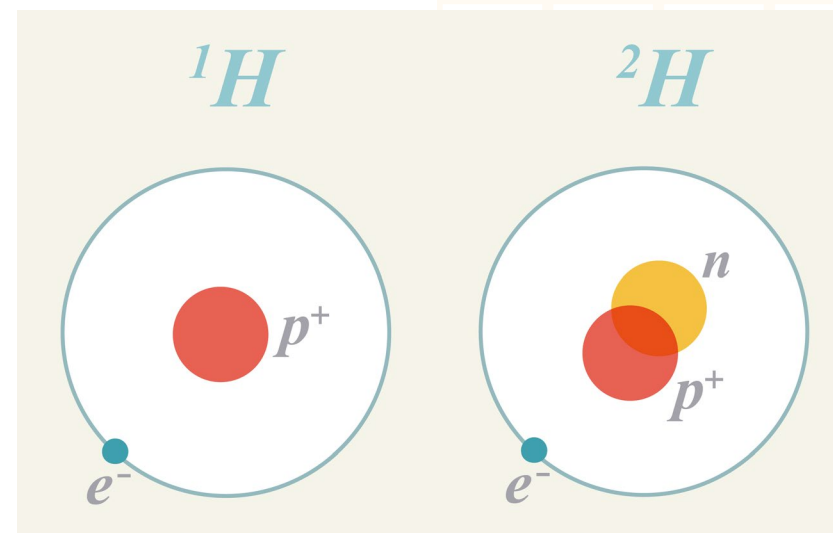


Metallic deuterium formed at high pressures

Written by Neil Goalby. Available from rsc.li/3pZFGkU

In theory, all elements become metallic at high pressures as the atoms are squeezed close enough that the electrons become delocalised. Scientists measure metallisation by observing a drop in a measurement called the band gap. The band gap measures the conductivity of a substance.

Scientists have tried to observe the metallisation of hydrogen as it is the simplest element. In 2020, researchers claimed to have shown that hydrogen, ^1H , formed a metallic state at a pressure of 425 GPa. Now scientists have found that an isotope of hydrogen called deuterium, ^2H , has shown a change to metallic behaviour. They saw a similar drop in the band gap at the higher pressure of 460 GPa.



Isotopes hydrogen, ^1H , and deuterium, ^2H , have different subatomic particles

Questions

1. What type of bonding does a H_2 molecule have?
2. Compare the number of subatomic particles found in atoms of hydrogen ^1H and deuterium ^2H .
3. Describe what metallic bonding is.