Chemistry 20

Unit A: Matter and chemical bonding

Bonding research and communication

Spark plugs and computer chips

- An aluminum oxide insulator in a spark plug is fired from a lattice that researchers already mapped.
- A silicon wafer is doped in a factory using what researchers learned about electrons in that crystal.



Bonding research report

- Three useful solids show research and manufacturing correcting each other.
- The drawing and the measured number have to describe the same ion grid.

Key terms

semiconductor

A solid, such as silicon, whose controlled conductivity comes from research on electrons in the crystal and from careful factory additions. (doped silicon)

ceramic

A solid such as aluminum oxide that is shaped and fired, with properties that follow from its lattice. (Al_2O_3 insulator)

composite material

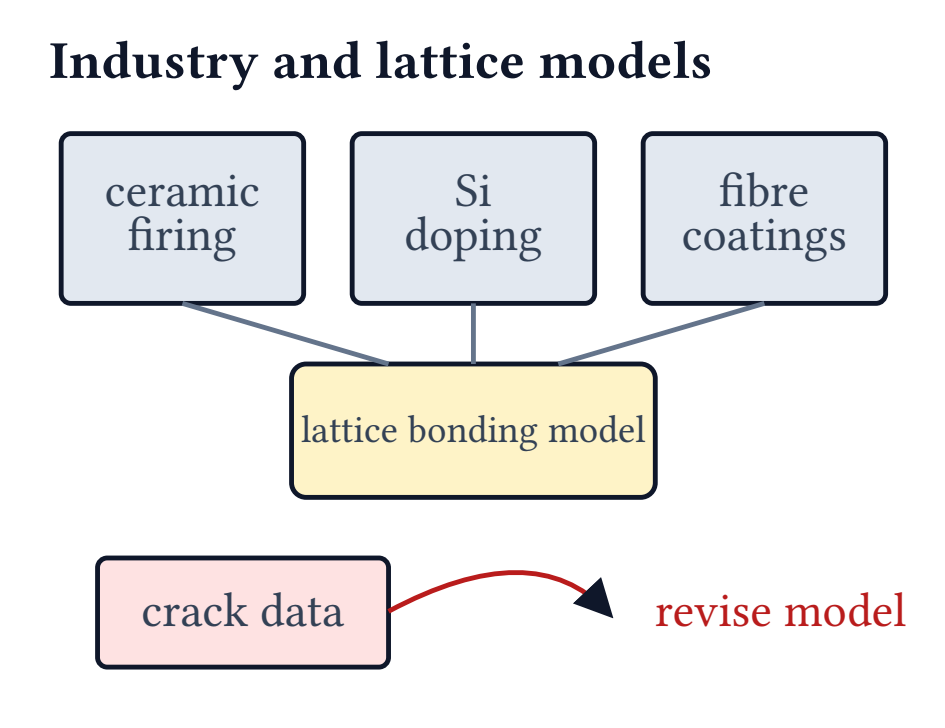
A manufactured solid that combines parts, such as glass fibres in a polymer, so the product has a property neither part has alone. (fibre plus binder)

significant digits

The digits in a measured or reported value that communicate its precision, such as the three digits in 801. (801 has three)

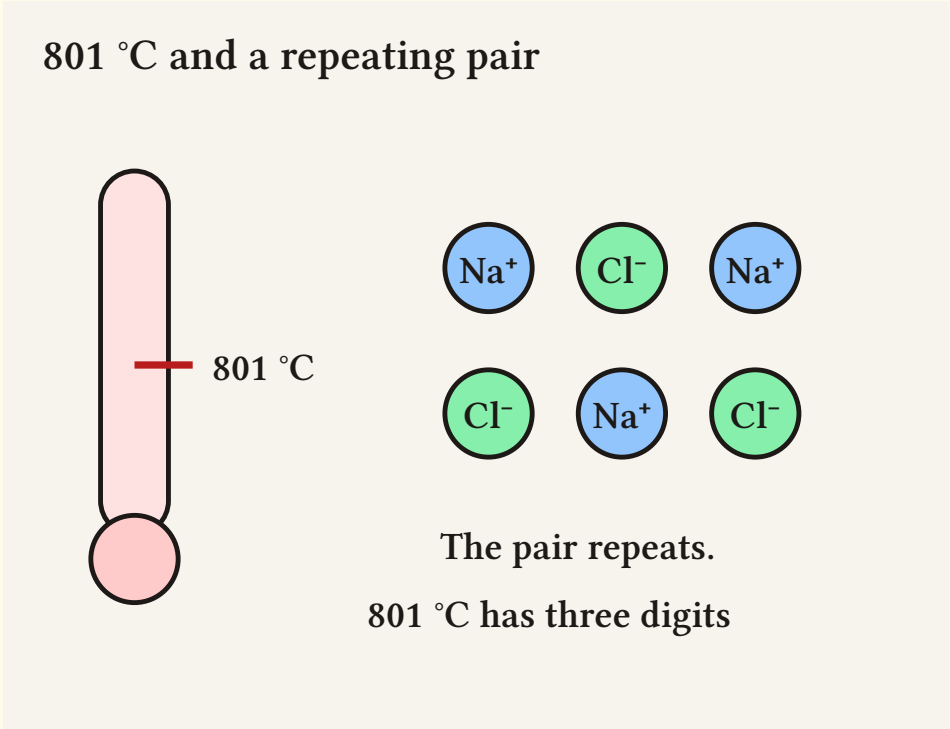
Industry and lattice models

- Ceramic firing, silicon doping, and fibre coatings are factory choices tied to bonding evidence.
- A new crack measurement can send the bonding model back for revision.



801 °C and a shared dash

- The reported melt 801 °C contains three significant digits.
- A drawing of one Na-Cl dash is rewritten as charged particles in a repeat.



A second model and a second number

- A classmate writes NaCl as a molecule because the formula has two symbols.
- The same classmate records the melt as 801.0 °C.

Evidence and the label

- A coordination question can be answered from a structure without launching a product.
- A panel load question is settled by a test on that product.

Image credits

User:Industry shill, Spark plug guts, public domain