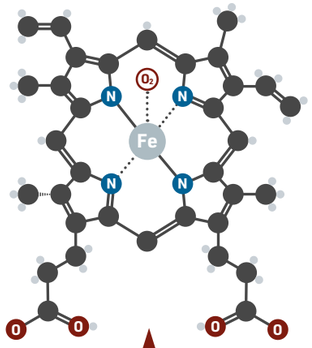
The chemistry of blood: Colour, smell, and types

COMPOUND INTEREST

The colour of blood



Haem B

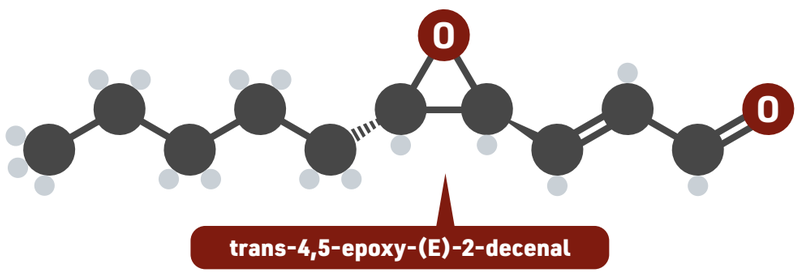
Oxygenated form

KEY: Carbon · Oxygen · Nitrogen · Hydrogen

Haemoglobin is a protein found in blood, built up of smaller sub-units containing 'haems'. These haems contain iron, and their structure gives our blood its red colour when oxygenated. Deoxygenated blood is a red colour – not blue!

Blood lost due to bleeding gradually turns brown, as haemoglobin is oxidised to methaemoglobin.

The smell of blood



trans-4,5-epoxy-(E)-2-decenal

The compound that gives human blood its characteristic metallic odour is *trans*-4,5-epoxy-(E)-2-decenal. The metallic smell of metals and blood coming into contact with skin is largely due to oct-1-en-3-one, produced due to the reaction between oxidised skin lipids and the iron in haemoglobin.

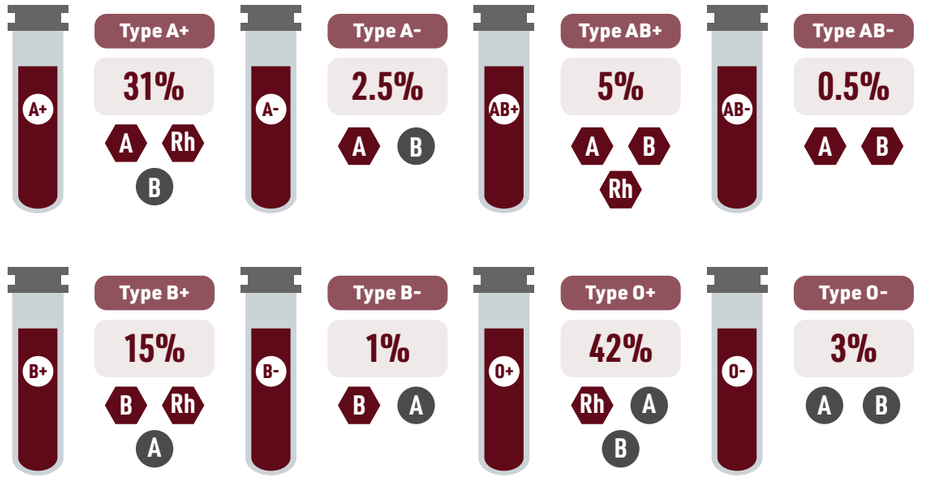
Blood types

Blood type is determined by the presence of antigens. Antigens are found on red blood cell surfaces; they bind to antibodies and stimulate an immune response. Antibodies are proteins in blood plasma that help fight infection.

APPROXIMATE WORLDWIDE DISTRIBUTIONS OF BLOOD TYPES

Antigen · Antibody

Usually only red blood cells are added in transfusions, so only blood antibodies of the person receiving blood are of concern.



A blood type's antibodies determine what blood can be received in transfusions. Someone with blood containing A antibodies can't be given blood containing A antigens. O can be given to all as it contain no A or B antigens.