Ceramics: insulated, brittle, hard, non-porous, crystalline/amorphous

Glass: Amorphous

Technical ceramics: have the ability to transduce energy

Glass melting point 1700 C

Add natron NaCo3, to lower melting point

Na forms 1 bond, this breaks up the network, and lowers the melting point

Sodium silicate glass, melting point 850, but dissolves in water

CaCo3, limestone, Ca wants to form 2 bonds,breaks up network less

Soda lime glass result of adding sodium and calcium

Rubert drop, outside cools fast inside cools slow

3000 bc faience glazes were used

1600 bc core wound vessels, wrapping glass around

900-600 bc new methods in Greece, slump glass and thousand flower method

100 bc glass blowing developed in Syria area, made glass inexpensive

Clear colorless glass through addition of MnO2

Made mirrors

670 ad stained glass window

Murano Italy glass 1330 ultra pure silica

1959 float glass, use molten tin

1970s fiber optic cable

Glasses are weak in tension but strong in compression

Corning ware

Gorilla glass potassium bath, puts into compression, sub K for Na

Sapphire al2o3

Moh hardness gorilla glass is 7

Sapphire is 9 only diamond is harder