

M18 i) Young's modulus is controlled by bonding and crystal structure (atomic packing)

ii) The glass transition temperature is the temperature at which the polymer changes from being an elastic solid to a viscoelastic one (at higher temps) which is due to the breaking (melting) of the van-der-Waals bonds between the polymer molecules

iii) Metals have higher densities because they have higher atomic masses and close packed crystal structures

iv) Interatomic bond energy $U(r)$ } separation
Interatomic force = $\frac{dU(r)}{dr} \Leftarrow$