



Schematic Temperature - Depth (pressure) diagram illustrating relationships between sedimentary processes, metamorphism, and the generation and intrusion of magma. (10 km ~ 3 kb.)

-- -- Examples of possible geothermal gradients during metamorphism.

- (A) Approx. lowest geothermal gradient found in the earth ($10^{\circ}/\text{km}$).
- (B) Approx. beginning of metamorphism: principally the onset of dehydration and decarbonation reactions, forming minerals not formed under near-surface conditions.
- (C) Approx. curve representing the lowest temperatures at which a rock of granitic composition will partially melt in the presence of sufficient water. (Water lowers the melting temperature of the rock by an amount which depends on the amount of water which can go into solution in the magma, and this increases with increase in pressure.) Lowest melting curves for other common rocks have similar shape, but lie at slightly higher temperatures.