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**Fluid Inclusion Evidence for Dynamic Pressure Fluctuations During Basin Evolution**

Homogenization temperatures of aqueous fluid inclusions can be used to interpret the thermal history of sedimentary rocks, but a ''pressure'' correction is required to determine the true trapping temperature. If hydrocarbon and aqueous fluids are trapped simultaneously, then the homogenization temperature equals the trapping temperature. The PVT properties of hydrocarbons, especially gases, are well known and allow trapping pressures to be determined. An assemblage of coeval aqueous and CH4-rich inclusions in a thrust detachment horizon (Brooks Range, northeast Alaska) allowed Parris, Burruss, and O'Sullivan (AAPG, in review) to demonstrate that pressure fluctuated between hydrostatic and lithostatic during the growth and fracturing of individual quartz crystals at depths of 8 to 10 km (200º to 250ºC) during deformation. Strata below the detachment horizon contain quartz-cemented fractures with crack-seal textures that have gas-undersaturated aqueous inclusions in the crack-seals that show homogenization temperature variations of 20º to 25ºC within a crack-seal inclusion assemblage and up to 45ºC among assemblages. If the gas-undersaturated inclusions were trapped under similar conditions at the same time as the CH4-rich inclusions in the detachment horizon, then homogenization temperature variations in the gas-undersaturated inclusions may reflect pressure fluctuations during fracture cementation. Homogenization temperature ranges of 20º to 45ºC are common in fluid inclusion studies in sedimentary rocks. One reason may be that pressure fluctuated during trapping. We therefore suggest that pressure be carefully considered in interpretations of fluid inclusion temperature measurements, especially in strata in rapidly subsiding basins and deforming fold-thrust belts.