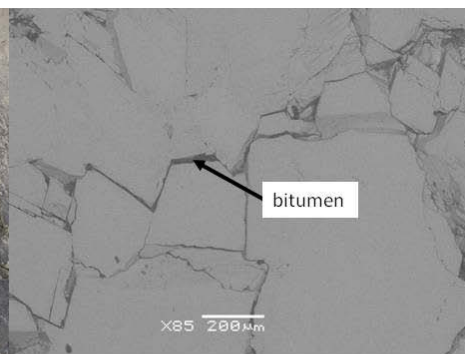


Calcite-cemented silty mudstone.

E-W calcite veins in Flat Creek Member of Utica Shale, South Chuctanunda Creek, Montgomery Co.

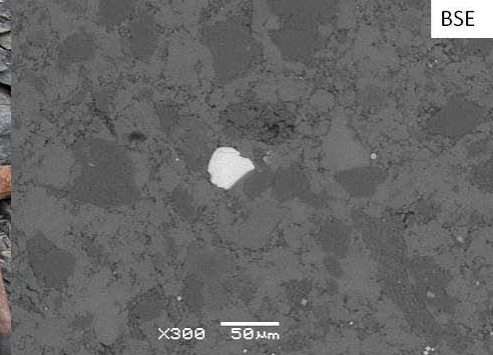
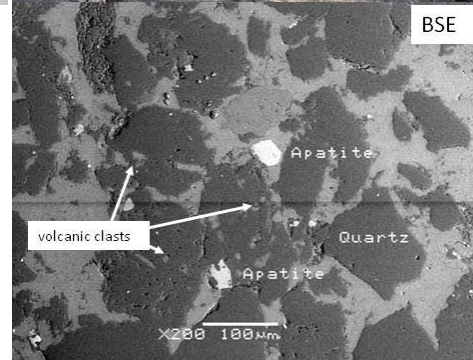
Veins occupy Mode 2 (strike-slip) fractures surfaced by sub-horizontal slickenlines.



Hydrocarbon-bearing veins in the lower Utica Shale (Flat Creek Member), Mohawk Valley, NY.

Thickest sections of veins occupy dilatational jogs in E-W Mode 2 fractures.

Multiple episodes of faulting and calcite precipitation are recorded. Bitumen and methane inclusions are common. Bitumen coats terminated calcite crystals in latest(?) growth zones.



N-S sand injectite and calcite veins, Utica Shale. Injectite is overlain by are capped coarsely crystalline calcite. Veins occupy Mode 1 (tensile) fractures.

Fine sand injectite is internally derived from Utica Shale during compaction. Sand was separated from mud by vertical flow of fluid in vein during E-W extension and compaction/dewatering of mud. Sand grains include volcanic clasts.

