

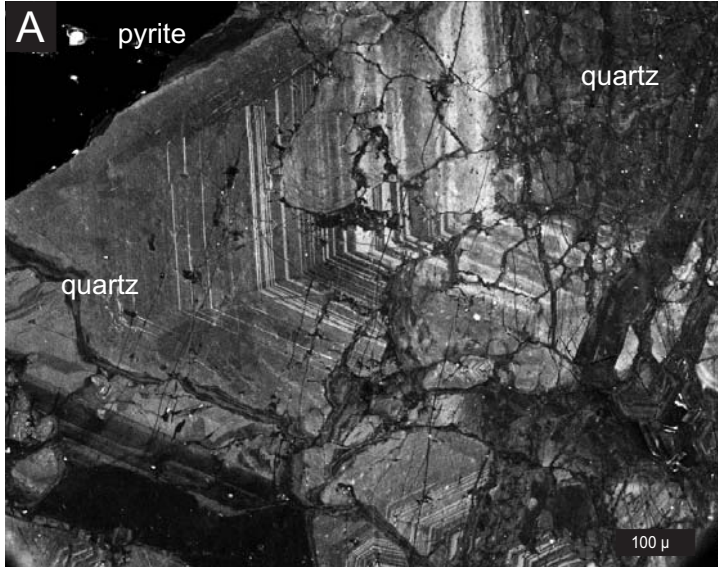
Figure 1. SEM-CL images show the textural and intensity difference between quartz precipitated in pyrite-quartz veins (A-C), and quartz precipitated in quartz-molybdenite veins (D-F). Images A-C show that quartz in pyrite-quartz veins has low luminescence and typically has euhedral growth zones, indicating growth into open space. Images D-F show quartz from quartz-molybdenite veins has higher intensity of luminescence and has little texture. The difference in intensity of luminescence between quartz in pyrite-quartz veins and quartz in quartz-molybdenite veins is actually far greater than is apparent in these images. SEM electron beam current was between 10 and 20 nAmps for images A-C, while it was between 3 and 8 nAmps for images D-F. If the images of quartz from the pyrite-quartz veins were acquired at the same conditions as the quartz-molybdenite quartz, it would appear to have no luminescence at all; alternatively, if the images of quartz from quartz-molybdenite veins were acquired at the same conditions as quartz from pyrite-quartz veins, the intensity would be so bright as to white out all texture in the quartz-molybdenite quartz. The distinction between the two generations of quartz is easy to make with SEM-CL and allows fluid inclusions to be related directly to specific mineralization events. (A=sample 10969R-2099; B=sample 11052-7305; C=sample 11148-1197; D=sample 11172-2756; E=sample 11172-3228; F=sample 11172-3773)

Figure 2. A) SEM-CL, B) backscattered electron, and C) cross-polarized transmitted light images of a pyrite-quartz vein. The SEM-CL image shows the distinction between texture and intensity of early quartz-molybdenite quartz (CL-bright), and later pyrite-quartz quartz (oscillating growth zones). The SEM-CL image clearly indicates that multiple mineralization events have occurred in the same rock. Rounding and embayment of the CL-bright quartz indicates dissolution of the CL-bright quartz occurred before precipitation of the CL-gray, zoned quartz. The distinction between quartz precipitated during different mineralization events cannot be made with transmitted light or backscattered electrons. The transmitted light image shows that late, euhedral, CL-gray quartz is crystallographically continuous with the early, CL-bright quartz. (Sample 10969R-2099)

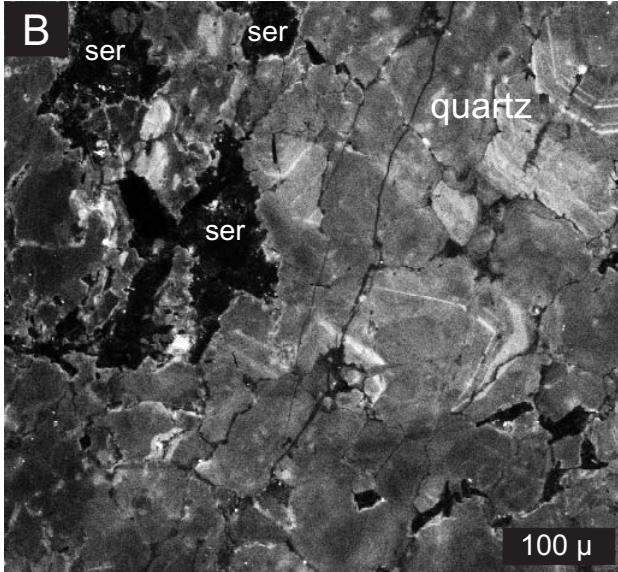
Figure 3. A) SEM-CL, B) backscattered electron, and C) cross-polarized transmitted light images of igneous (Butte quartz monzonite) quartz, showing splatter and cobweb texture. This texture likely results from dissolution focused along microfractures. In this image, much more detail is revealed by SEM-CL than by backscattered electrons or transmitted light. Some trails of tiny fluid inclusions are visible in transmitted light that correspond to the CL-dark fractures in the SEM-CL image. The splatters, however, do not appear to correspond in to areas of fluid inclusion entrapment. (Sample 11148-1219.5)

Figure 4. SEM-CL image showing recrystallized quartz in a quartz-molybdenite vein. Here, the original quartz precipitated in a quartz molybdenite vein as CL-bright quartz, however a slight decrease in luminescence has occurred in many grains especially along grain boundaries and around CL-dark splatters. The difference in intensity is modest and is likely caused by infiltration of late hydrothermal fluids in microfractures and along grain boundaries. (Sample 11169-5286)

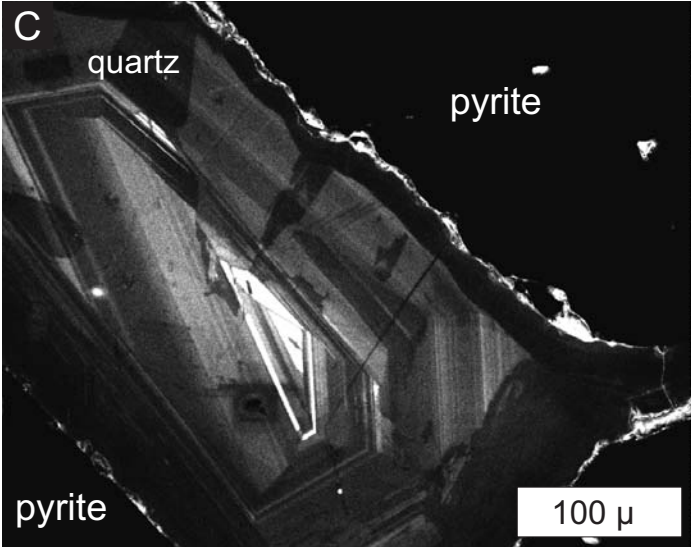
Figure - repos fig 5 - ?Figure 5. SEM-CL image of a quartz-molybdenite vein that has been repeatedly and intensely fractured by later pyrite-quartz-bearing fluids. The entire field of view is quartz. A few crosscutting relations are apparent indicating more than one fracturing event occurred. (Sample 11052-7025)



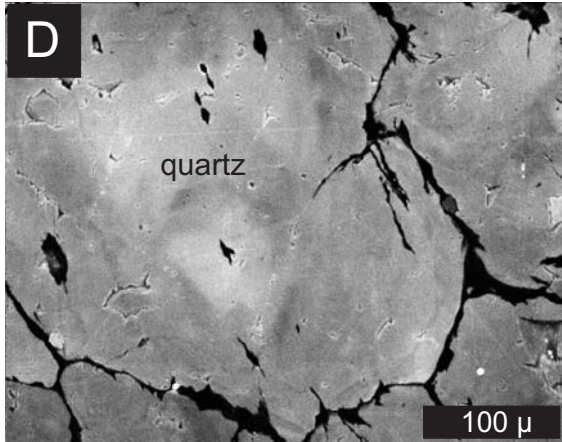
Rusk & Reed- repository Fig 1A



Rusk and Reed repository Fig 1B



Rusk & Reed- repository Fig 1C

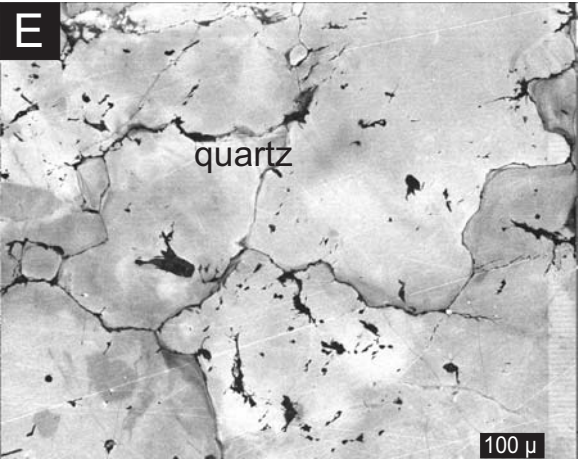


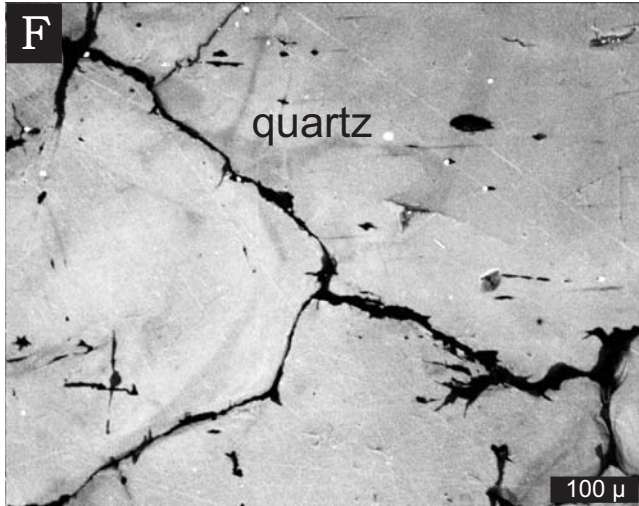
Rusk & Reed- repository Fig 1D

E

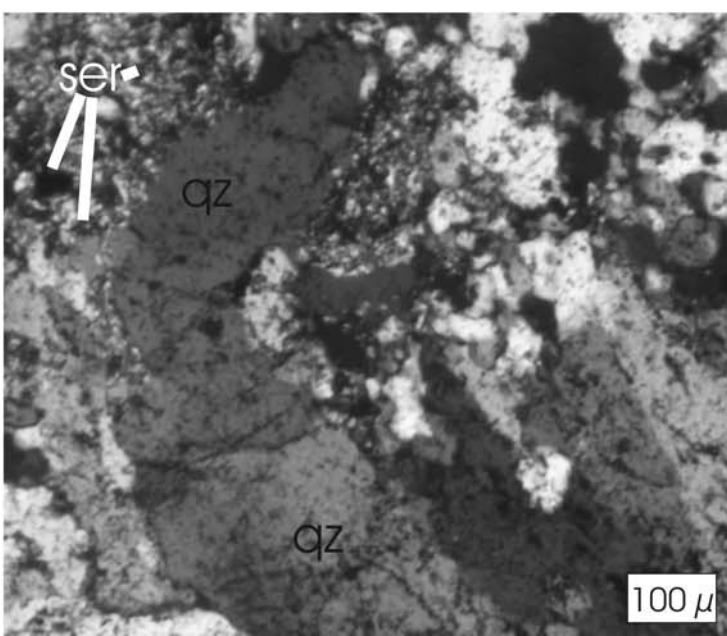
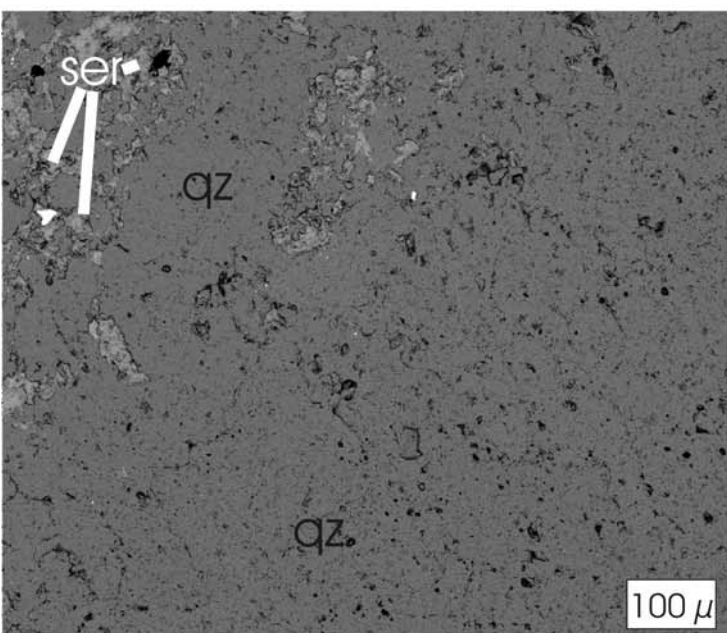
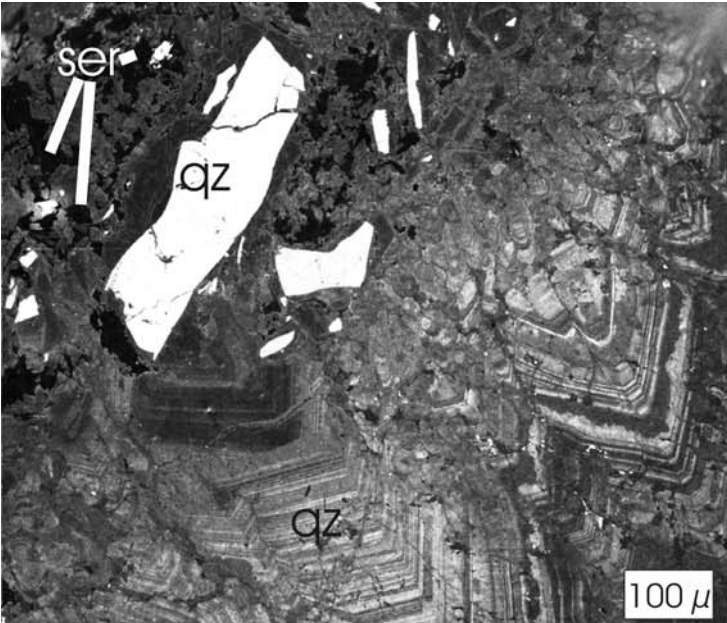
quartz

100  $\mu$

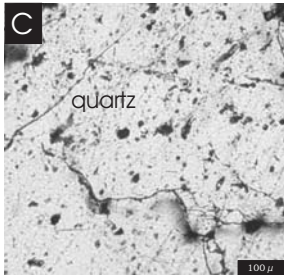
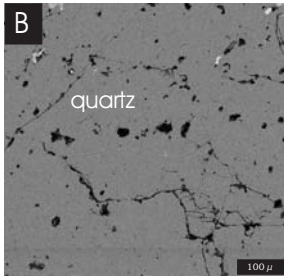
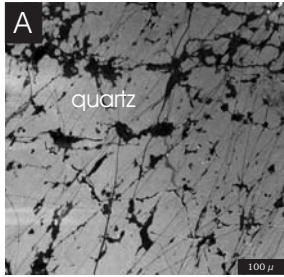




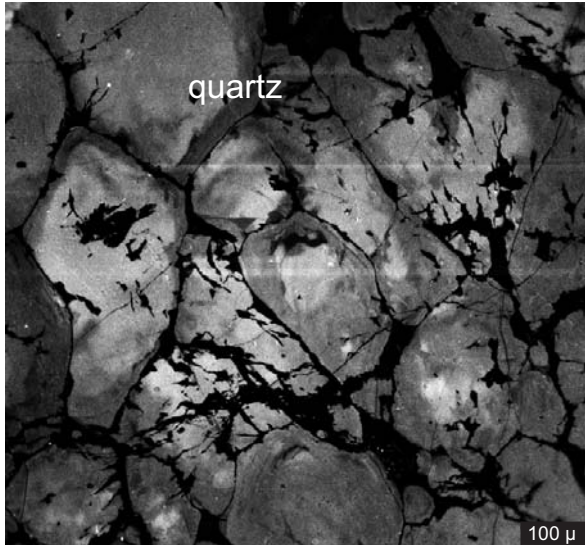
Rusk & Reed- repository Fig 1F



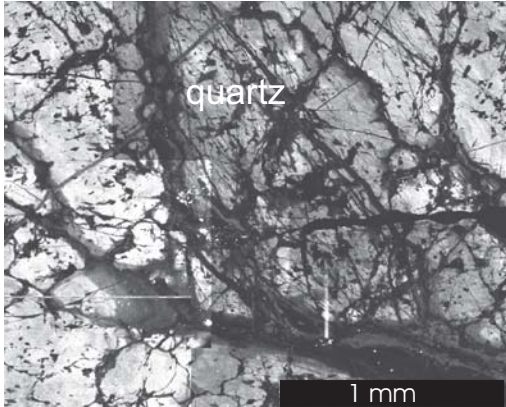




Rusk & Reed repository Fig 3



Rusk & Reed- repository Fig 4



Rusk & Reed-repository Fig 5