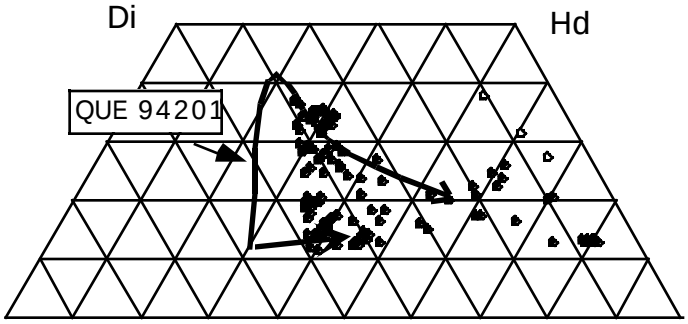
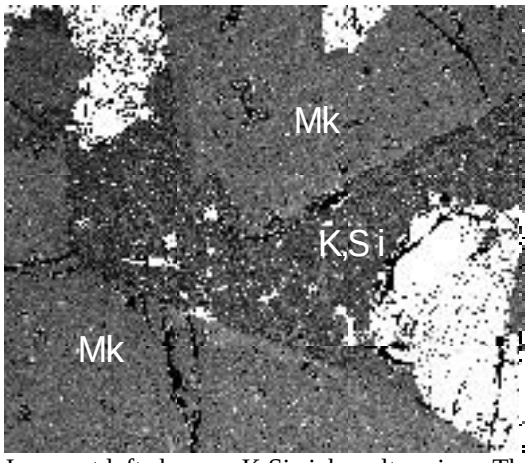
LATE-STAGE CRYSTALLIZATION FEATURES OF LOS ANGELES, A NEW BASALTIC SHERGOTTITE. James P. Greenwood[1,2], Paul H. Warren[2], and Alan E. Rubin[2]. [1]Dept. of Chemistry and Biochemistry, [2]Institute of Geophysics and Planetary Physics (all at: University of California, Los Angeles, California 90095-1567, USA).

Los Angeles is the fifth known basaltic shergottite, after Shergotty, Zagami, EETA79001, and QUE94201 and was recognized as a meteorite at UCLA on Dec. 17, 1999 [1]. Los Angeles is more differentiated than the other shergottites [2]. The compositions of pyroxenes from Los Angeles (shown below) show that it is less primitive than QUE94201; they have a lower Mg* (Mg/Mg+Fe molar) than pyroxenes in QUE94201 although both trends are very similar. The other three basaltic shergottite augite and pigeonite trends are clearly resolved from each other. Los Angeles is also unique in the quantity of late-stage magmatic features, such as large areas of pyroxferroite, high modal contents of phosphates, and large areas of K,Si-rich mesostasis. Some of the complex features of this new shergottite are illustrated below.

References: [1] Rubin A. E. et al. (2000) this volume; [2] Warren P. H. et al. (2000) this volume.





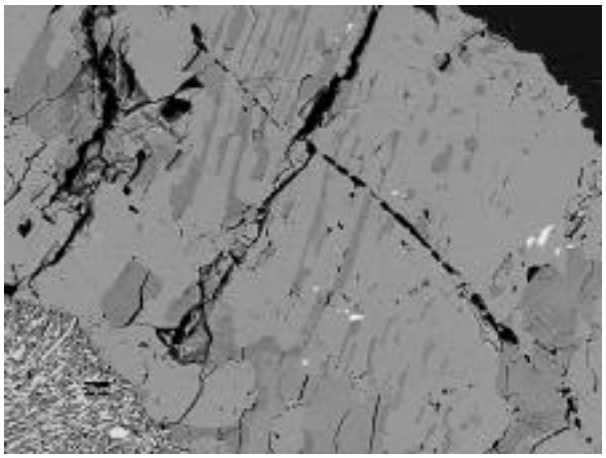


Image at left shows a K,Si-rich melt region. The K,Si-rich melt region forms sharp contacts with angular grains of maskelynite. We interpret this as late-stage K,Si-rich melt filling large pore spaces between plagioclase laths. Higher resolution images (not shown) show that the K,Si-rich melt region is broken down into K-feldspar rich and Si-rich regions. Image at right shows the breakdown product of pyroxferroite at lower left and coarsely exsolved ferroaugite (med. grey) in ferropigeonite (lgt. grey). A small faulted opaque is seen at right-center.

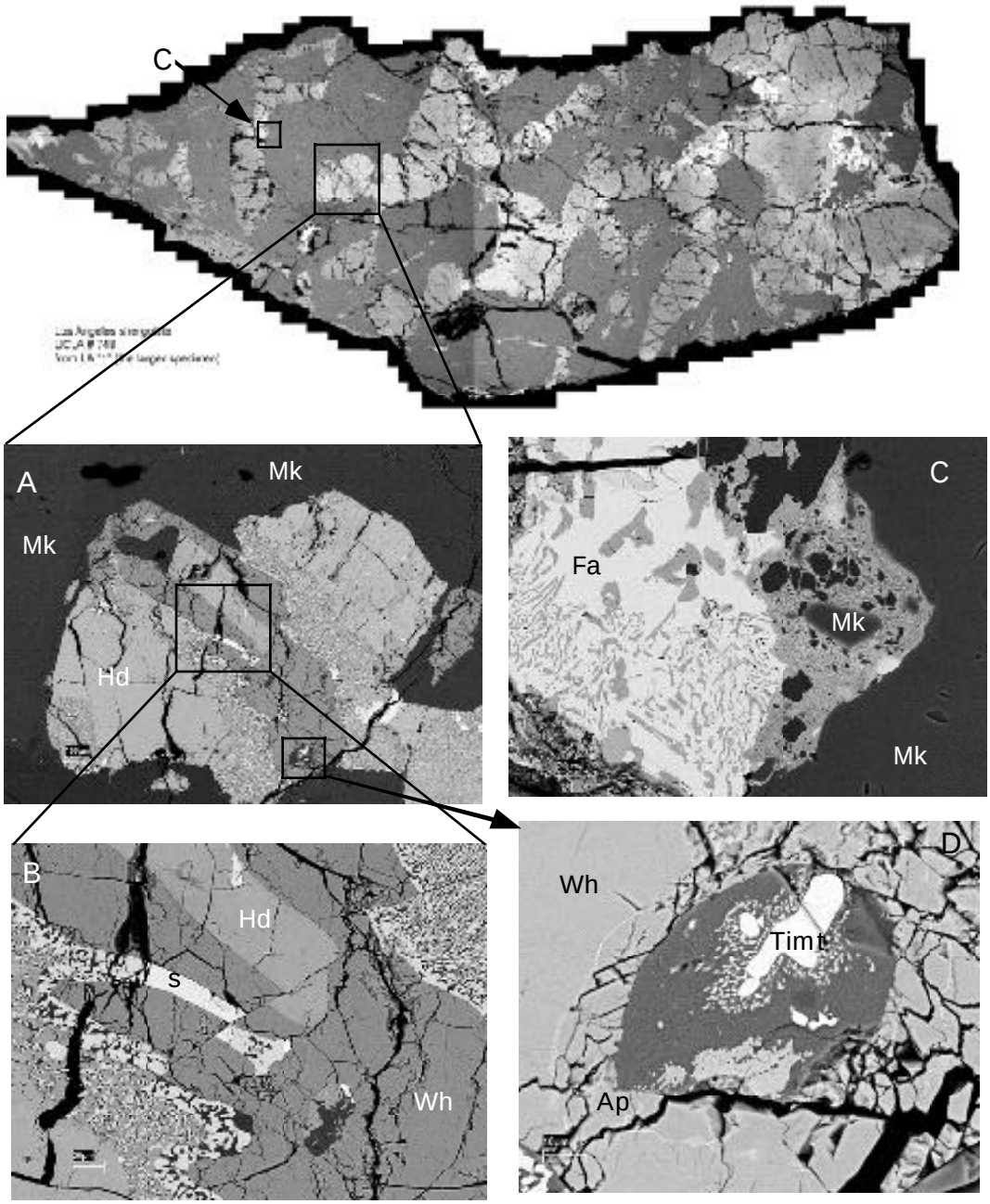


Fig. 1. Los Angeles Shergottite: Top: BSE image of thin-section UCLA748 illustrating the overall pyroxene-plagioclase fabric. Insets show (A) late-stage crystallization area with a fault that is oriented from 2 o'clock to 7 o'clock. (B) Inset of (A) showing close-up of fault area. Fault cuts hedenbergite (Hd), whitlockite (Wh), pyrrhotite (s) and pyroxferroite. The pyroxferroite is broken down to fayalite (bright), hedenbergite (light grey) and silica (dark grey). (D) shows a close-up of a K,Si-rich melt inclusion in whitlockite. Apatite (Ap) has crystallized on the walls of the inclusion. Baddelyite (ZrO_2) is the bright lower phase in the melt inclusion. (C) A brecciated region next to maskelynite, silica, fayalite, and hedenbergite. The large dark clasts in the breccia are silica and maskelynite. This either formed during shock (as kinetics of dissolving silica and maskelynite are too slow for complete resorption) or as a trapped assemblage of fusion crust that penetrated the porous interior.