THE KENDLETON L4 FRAGMENTAL BRECCIA: PARENT BODY SURFACE HISTORY. A.J. Ehlmann[1], K. Keil, E.R.D. Scott, Dept. of Geology, Institute of Meteoritics, Univ. of New Mexico, Albuquerque, N.M. 87131. [1] Permanently at Dept. of Geology, Texas Christian Univ., Fort Worth, Texas. 76129. H.W. Weber, L. Schultz, Max-Planck-Institute of Chemistry, Mainz, F.R. of Germany.

The Kendleton chondrite (fall, 1925 hrs., May 2, 1939) is a fragmental breccia consisting of a dark, chondritic matrix (mostly L4 material) with light-colored chondritic (L5/6); shock-blackened, partly glassy; unequilibrated (type 3) chondritic; light-colored microporphyritic melt rock; and chondrule-free tridymite-low-Ca pyroxene clasts. Although macroscopically similar to a regolith breccia (light-dark structure), Kendleton does not contain solar wind implanted gases (3He 3.25, 4He 840, 20Ne 0.84, 21Ne 0.77, 22Ne 0.87, 36Ar 6.8, 38Ar 1.34, 40Ar 5300, 84Kr 0.10, 132Ne 0.14, in 10-8cc STP/g; also Taylor and Heyman, 1969). The rock was not appreciably outgassed and reheated during or after lithification, as indicated by 36Ar contents and lack of reaction between clasts and dark, chondritic matrix. There are no extensive rock-wide shock effects (only minor shock veins), although individual constituents and clasts are highly shocked.

The dark chondritic matrix consists of relatively homogeneous olivine and somewhat heterogeneous low-Ca pyroxenes: means in 9 sections are Fa 21.9-23.3, Fs 15.1-18.6. PMD of FeO in olivine is 0.9 to 3.7 (excluding one Fa6 grain), indicating type 4. Kendleton is unique in that it is mostly (about 80%) made of dark, chondritic matrix whose olivine and pyroxene compositions indicate heterogeneities on a thin section scale. Round to angular, light-colored chondritic clasts (the light portions of typical light-dark structured chondrites) have olivine of Fa 23.5 (σ = 0.6) and low-Ca pyroxene of Fs 19.2 (σ = 2.5); chondrules are less well-defined than those in the dark, chondritic matrix. Thus, these clasts are type L5/6. Shock-blackened, partly glassy clasts are angular to irregularly-shaped, up to 15 mm in size, and are the dominant clast type; boundaries are sharp to diffuse. They consist of faint, isolated to grouped chondrules; shock-melted Fe,Ni and FeS; glassy material; and olivines and pyroxenes with means in 5 clasts of Fa 22.2 - 24.2 and Fs 15.8 - 20.1. One clast contains a relict type 3 clast. This unequilibrated (type 3) clast has slightly turbid, igneous glass and mean olivine of Fa 17.9 (N = 35, σ = 8.9) and low-Ca pyroxene of Fs 15.9 (N = 14, σ = 6.1). One barred olivine chondrule has Fa 1-19.9. A light-colored microporphyritic clast has subhedral to euhedral olivine (mean Fa 21.9, N = 45, σ = 0.27), in a matrix of devitrified glass. This melt rock clast is depleted in Fe,Ni and FeS and equilibrated prior to rock lithification. A tridymite-low-Ca pyroxene clast, 6 mm in size, has no chondrules and consists of a large area of tridymite, intergrown with small and adjacent large low-Ca pyroxene (mean Fs 20.0, N=29, σ =1.0). Tridymite exhibits sharp boundaries with the dark, chondritic matrix and outlines suggesting crystal faces. It is intensely fractured and shocked.

Conclusions. Kendleton is a fragmental breccia that may have resided in a regolith, as indicated by the light-dark structure and presence of shock-blackened and a melt rock clast. Residence time in a regolith was short, as indicated by the absence of detectable solar wind gases and matrix heterogeneity on a thin section scale, (suggesting poor mixing and low maturity). Although all materials except the tridymite-low-Ca pyroxene clast are of L-group composition, compositional variabilities between clasts and presence of type 3 inclusions indicate heterogeneities across the source regions on the parent body. Further work is required on the tridymite-low-Ca pyroxene clast before genetic inferences can be made.