SEM Images
FAS Sample Exposed for 1000 Hours
(FAS Sample #2)

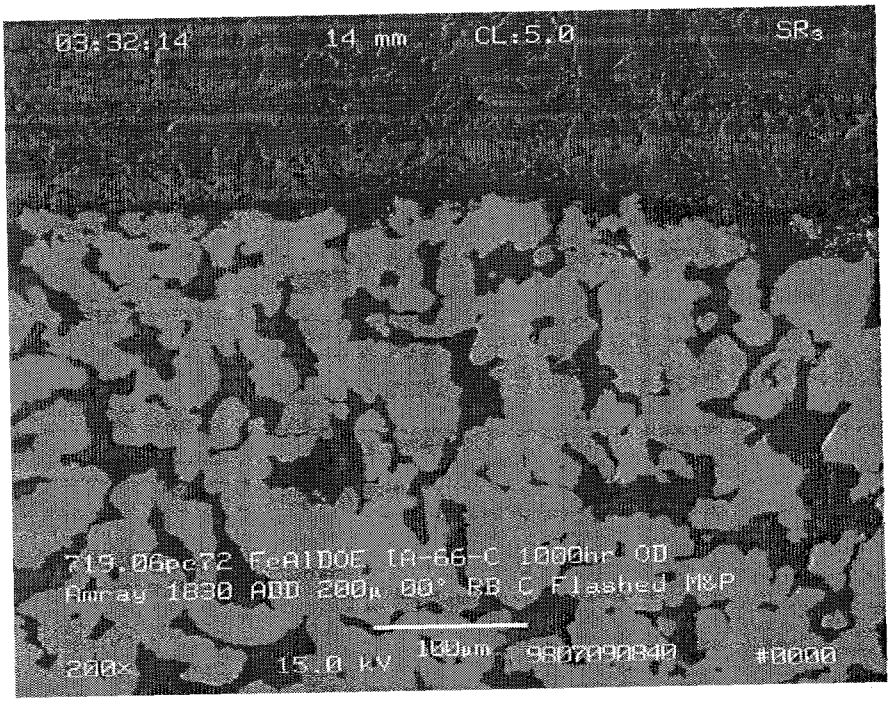

Figure 44: FAS cross-section. Upstream edge shown. Exposed for 1000 hours.

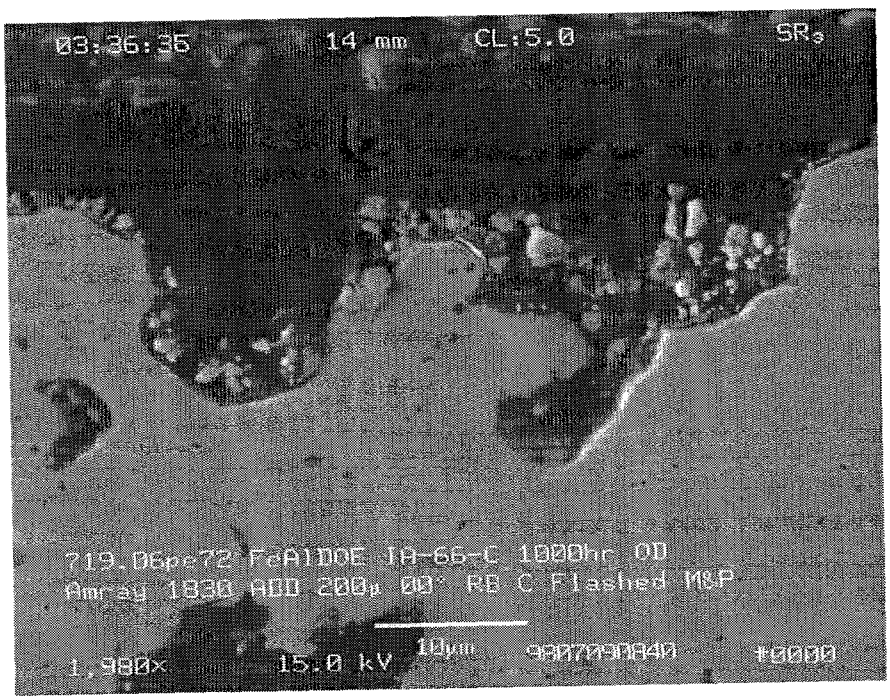

Figure 45: FAS cross-section. Upstream edge shown. Exposed for 1000 hours. Similar iron sulfide crystal formation as seen in Figure 34.

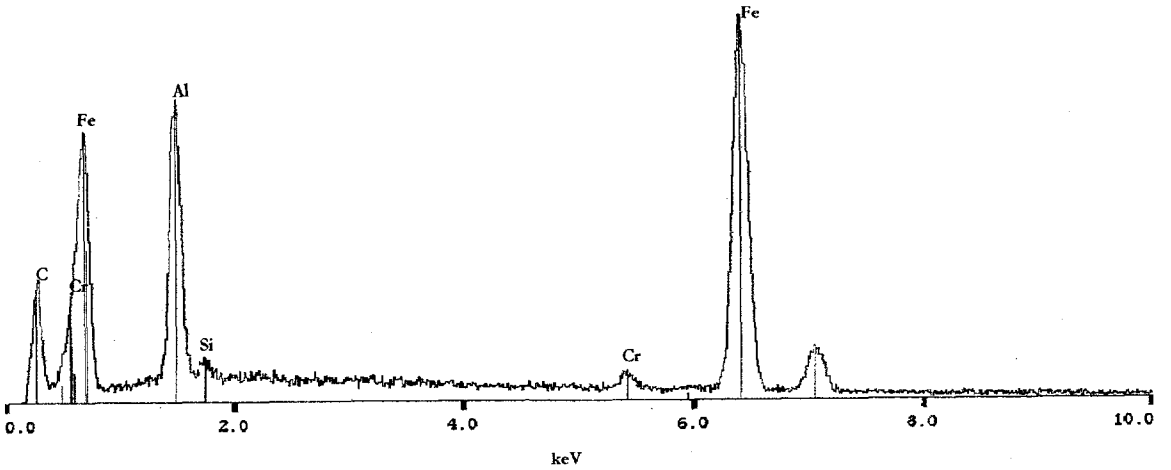

Figure 46: Partial field of base metal in Figure 45. Typical iron aluminide signature. No sulfur penetration.

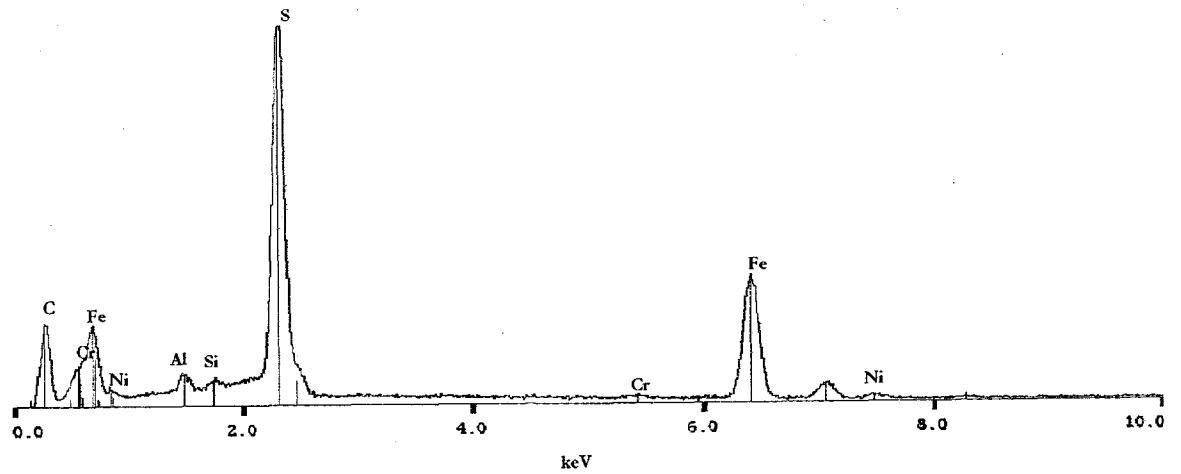

Figure 47: Partial field of upstream edge of Figure 45. High sulfur and iron. A strong indication of iron sulfides.

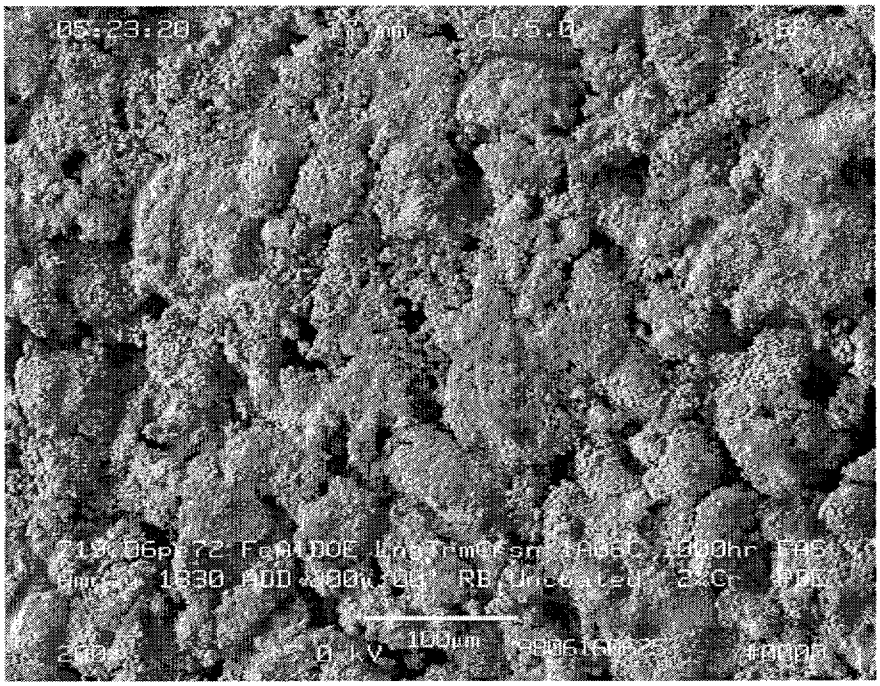

Figure 48: FAS upstream surface. Exposed for 1000 hours. Covered in iron sulfide crystals.

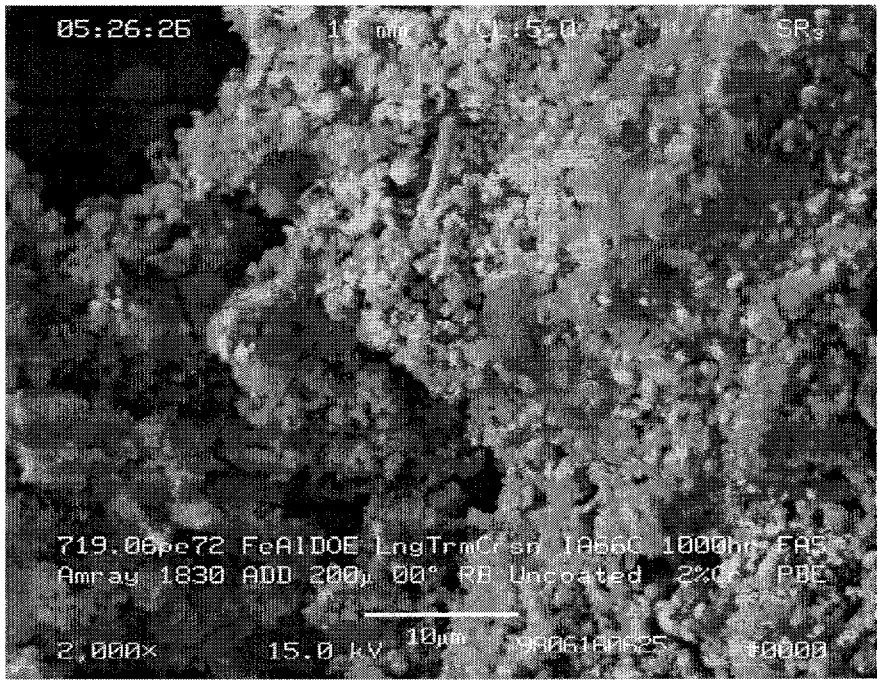

Figure 49: FAS upstream surface. Exposed for 1000 hours.

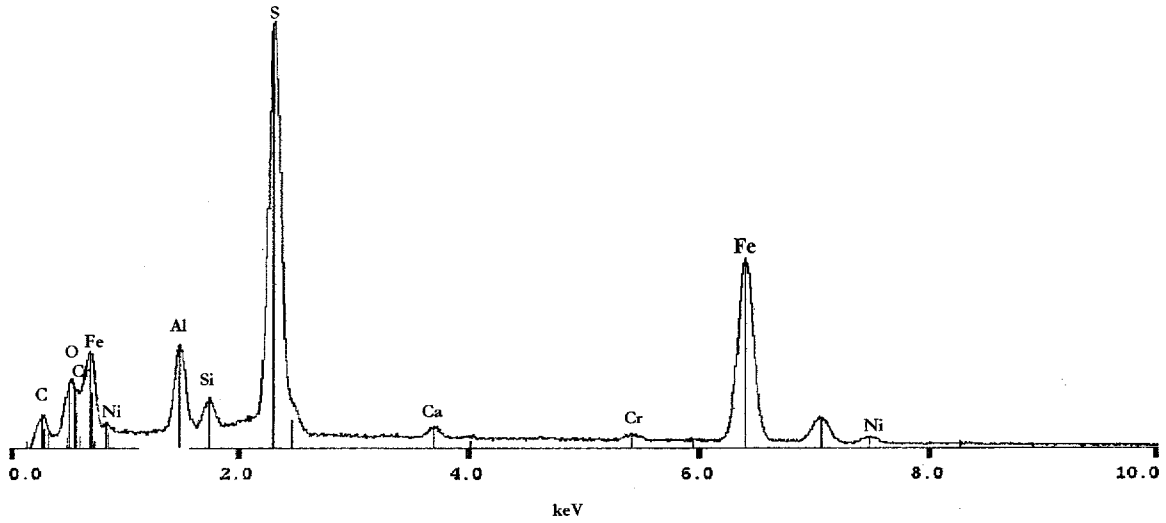

Figure 50: Full screen spectrum of Figure 49. High sulfur and iron. Strong indication of iron sulfide.

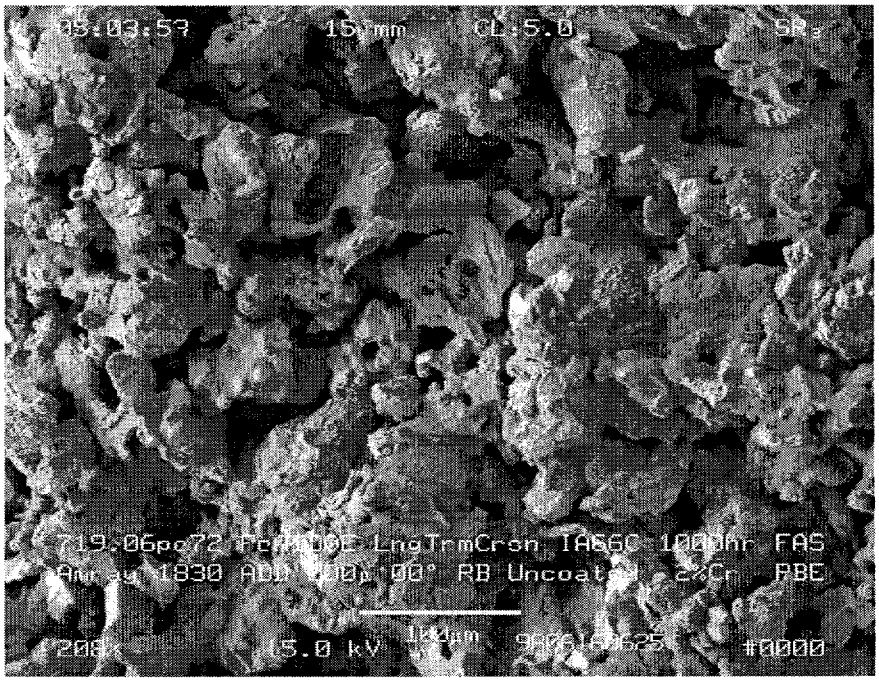

Figure 51: FAS fracture surface. Exposed for 1000 hours.

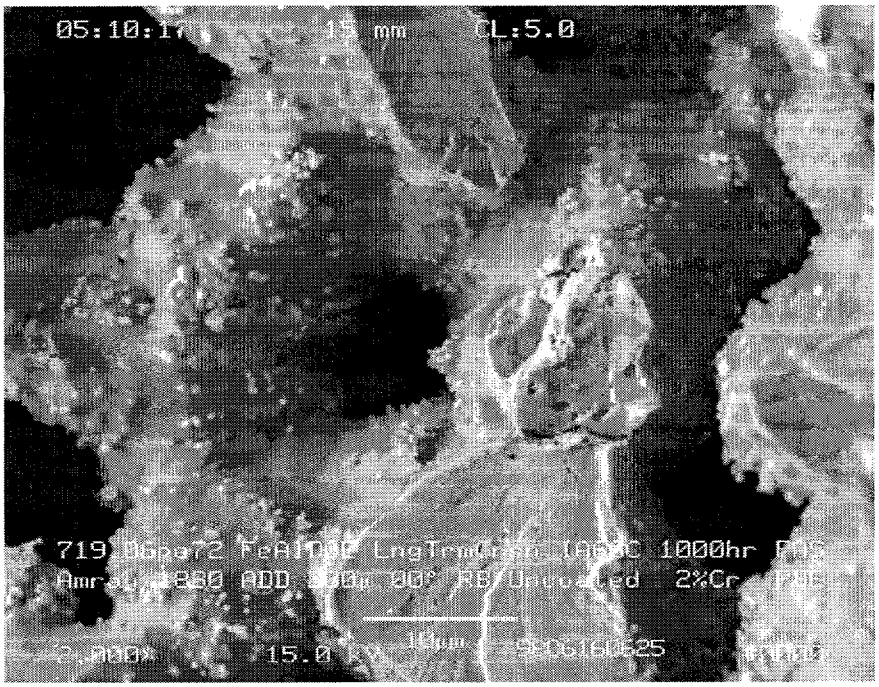

Figure 52: FAS fracture surface. Exposed for 1000 hours. Zirconia nodules, some porosity in the sinter bonds.

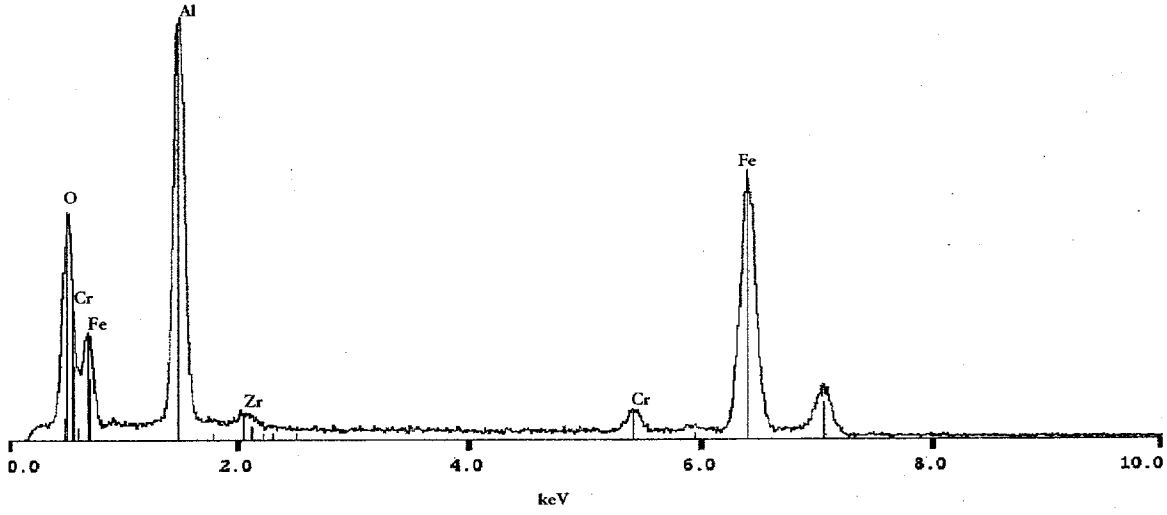

Figure 53: Full screen spectrum of Figure 52. Oxygen peak indicates a thin alumina layer on the surface of the sample.

SEM Images
FAS Sample Exposed for 1500 Hours
(FAS Sample #3)

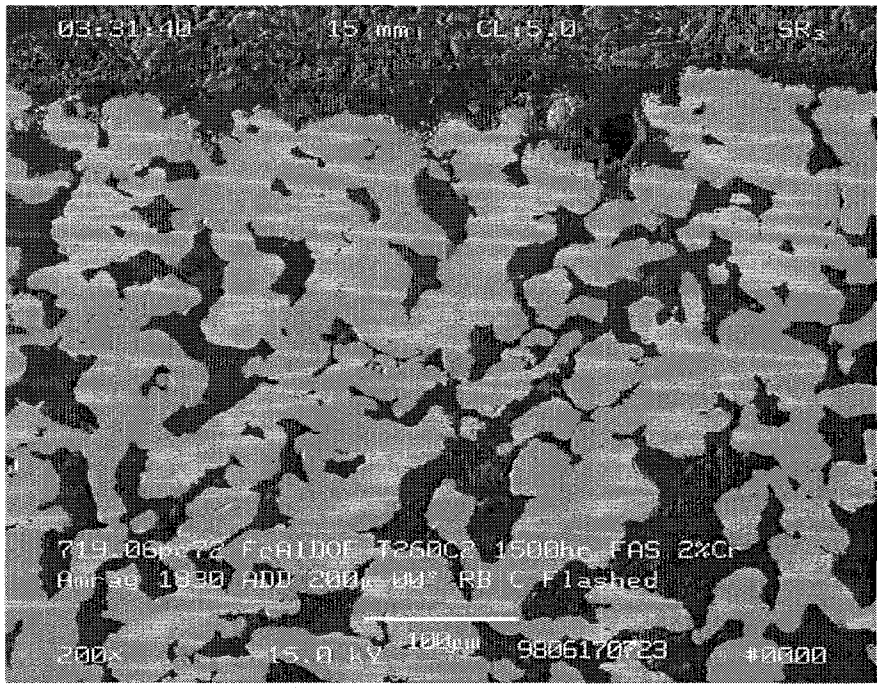

Figure 54: FAS cross-section. Upstream edge shown. Exposed for 1500 hours. Iron sulfide crystals on upstream edge are barely visible at this magnification.

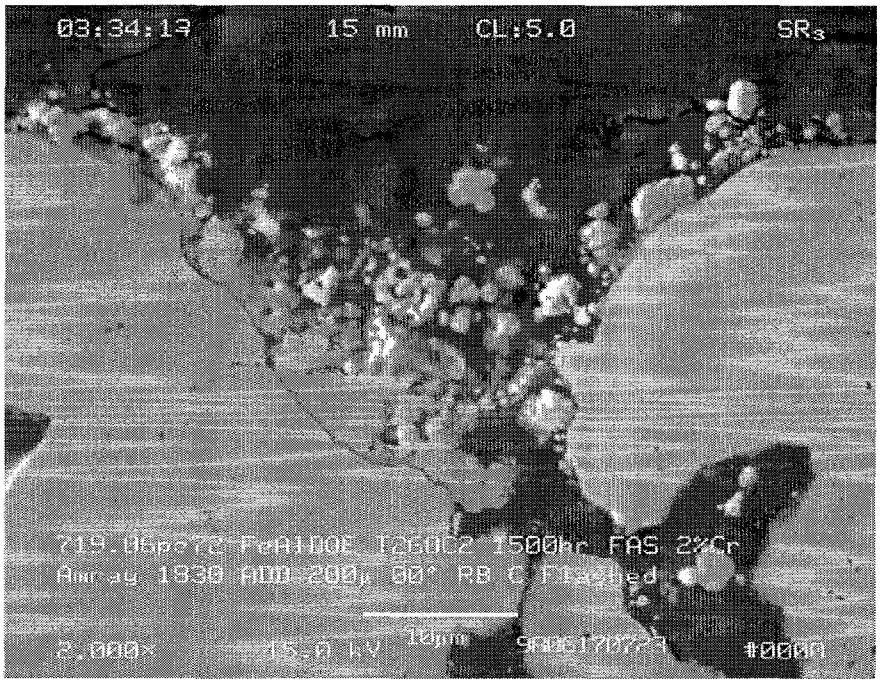

Figure 55: FAS cross-section. Upstream edge shown. Exposed for 1500 hours. Amount of crystals are similar to Figure 34. No increase in sulfide formation over time, after 500 hours of exposure.

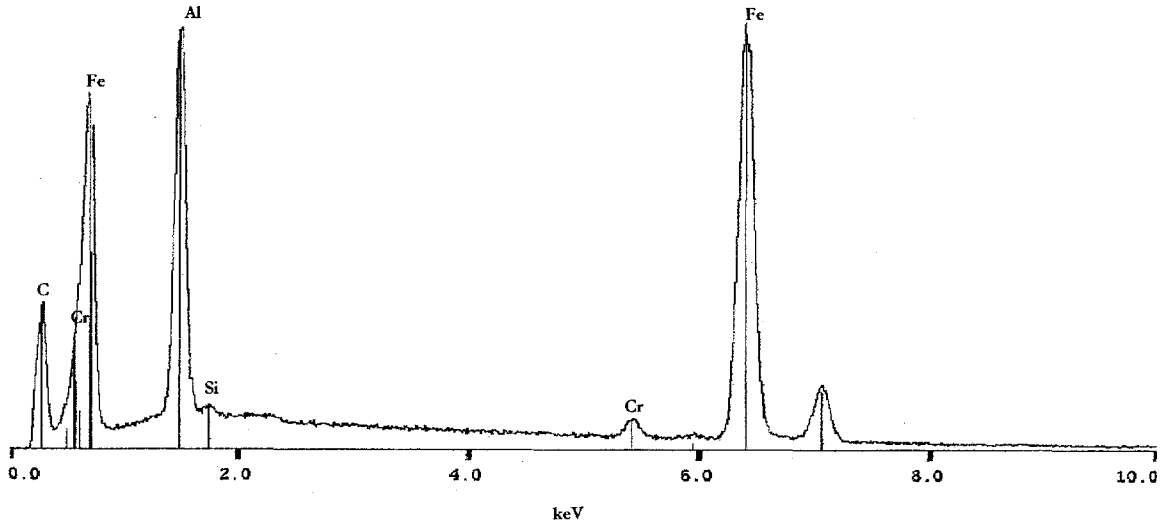

Figure 56: Spectrum of base metal on Figure 55. Typical iron aluminide signature.

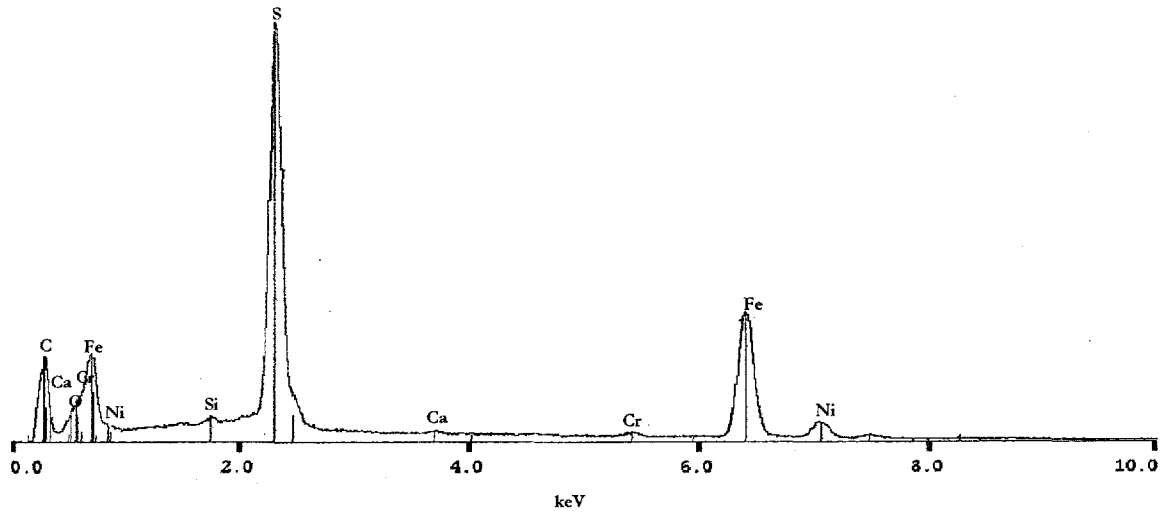

Figure 57: Spectrum of upstream edge of Figure 55. High sulfur and iron. Strong indication of iron sulfides.

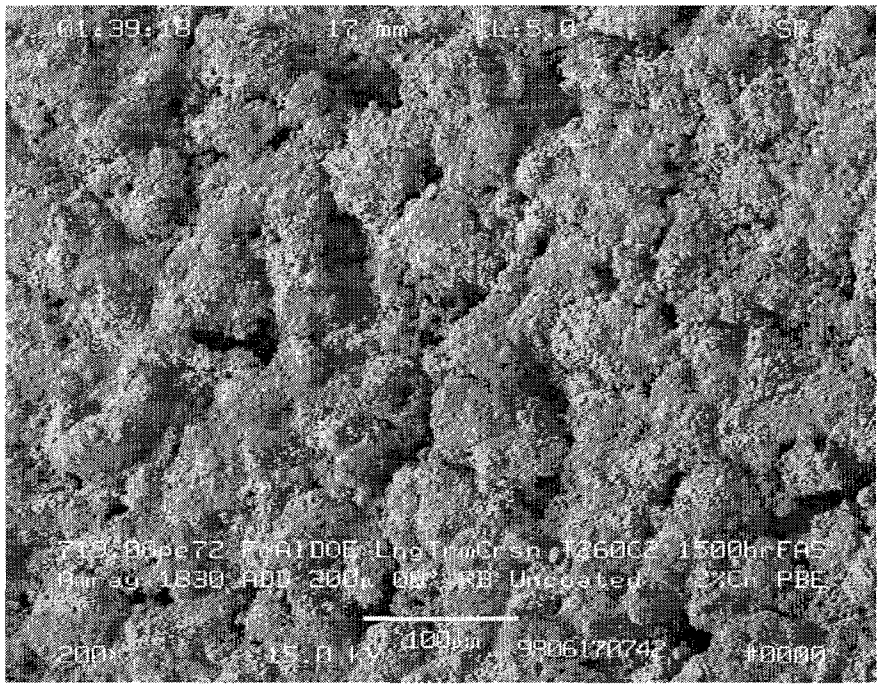

Figure 58: FAS upstream surface. Exposed for 1500 hours. Covered in iron sulfide crystals.

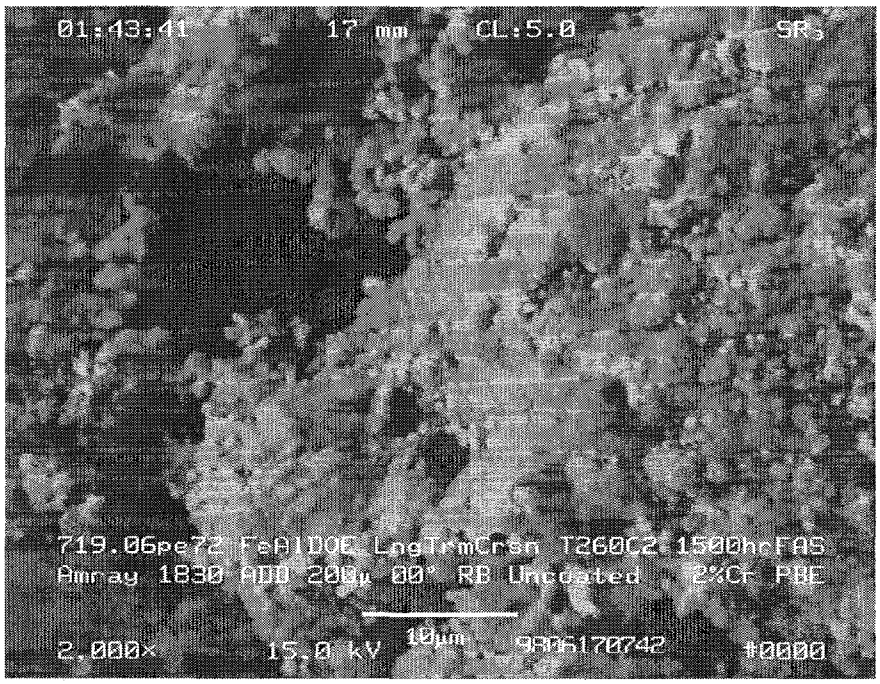

Figure 59: FAS upstream surface. Exposed for 1500 hours.

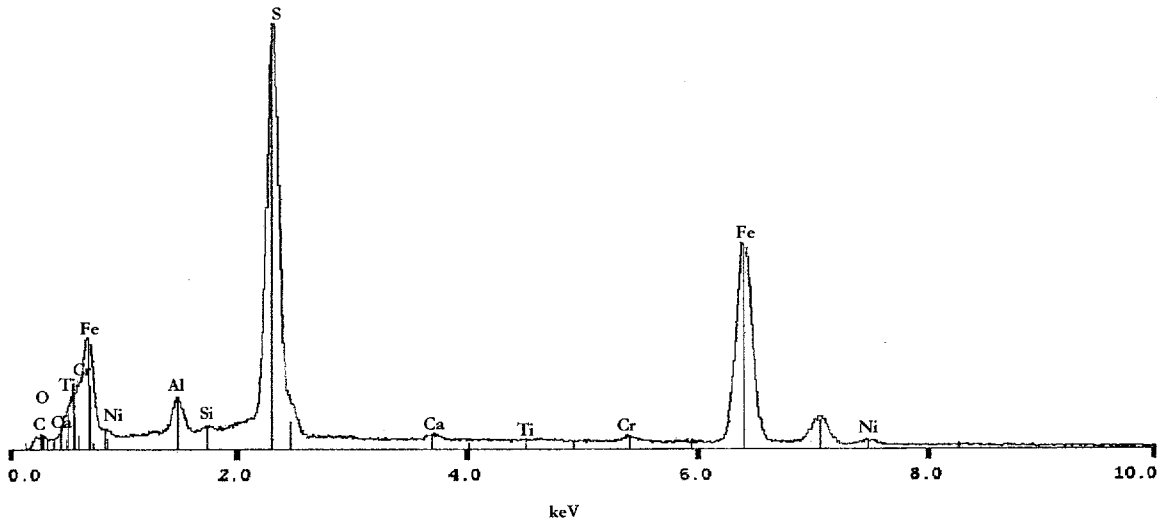

Figure 60: Full screen spectrum of Figure 59. High sulfur and iron. Strong indication of iron sulfides.

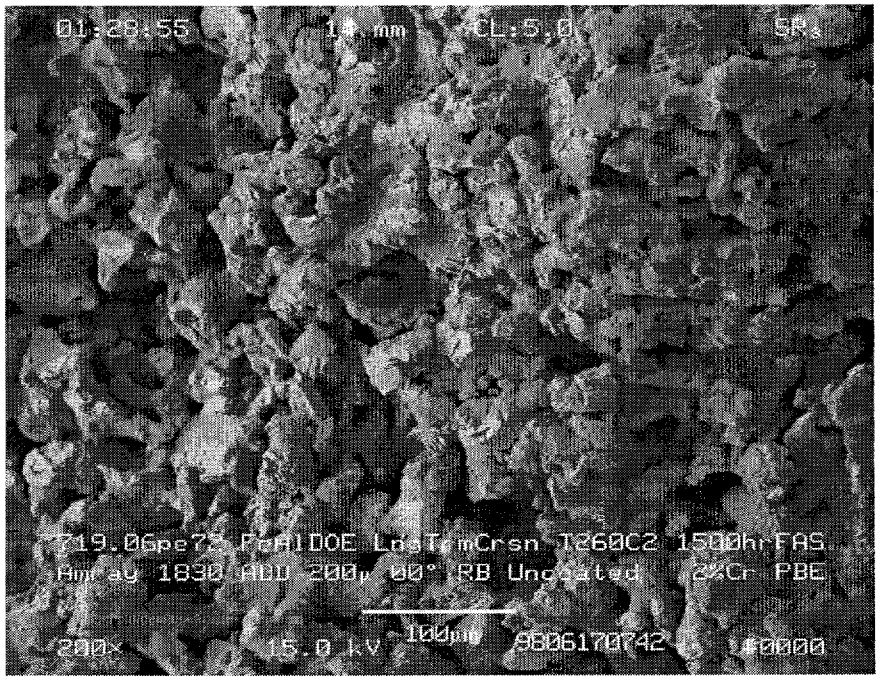

Figure 61: FAS fracture surface. Exposed for 1500 hours.

Figure 62: FAS fracture surface. Exposed for 1500 hours. Typical unexposed iron aluminide fracture surface with some porosity at sinter bond, zirconium/zirconia nodules on surface. Brittle transgranular fracture.

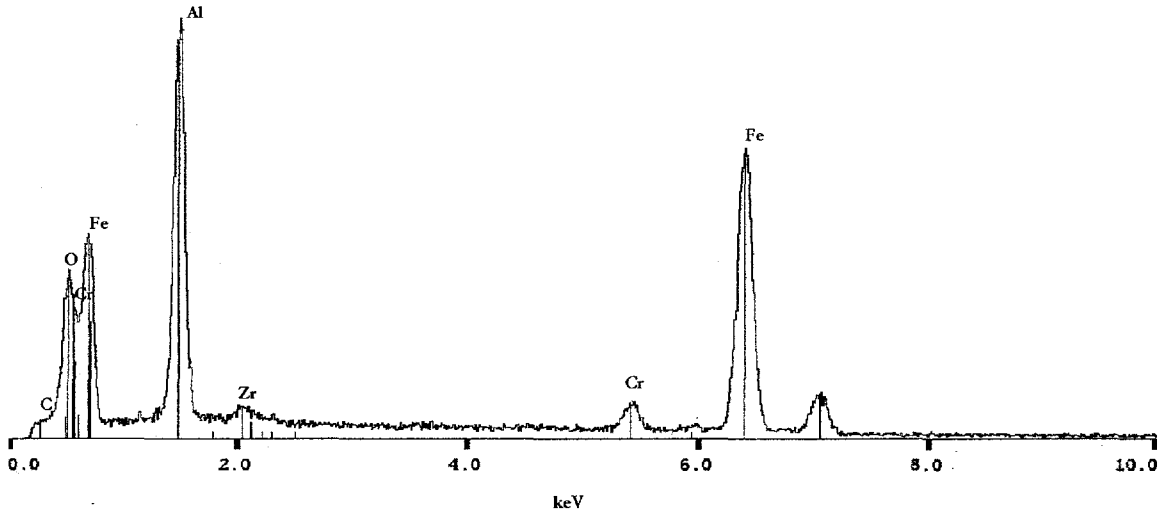

Figure 63: Full screen spectrum of Figure 62. Typical iron aluminide signature.

SEM Images
FAL Control Sample

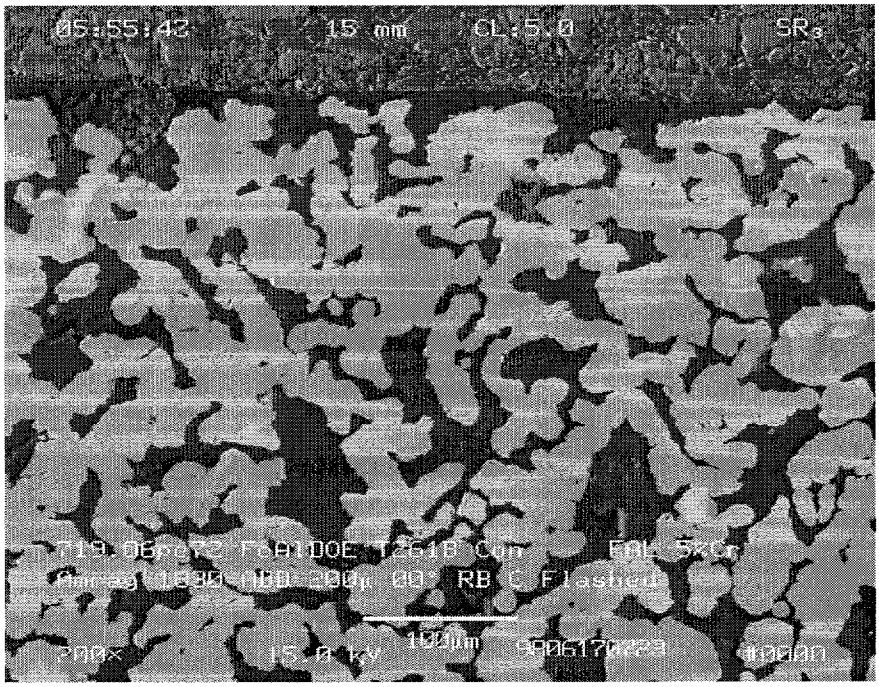

Figure 64: Cross-section of FAL control sample. Preoxidized for seven hours at 800°C.

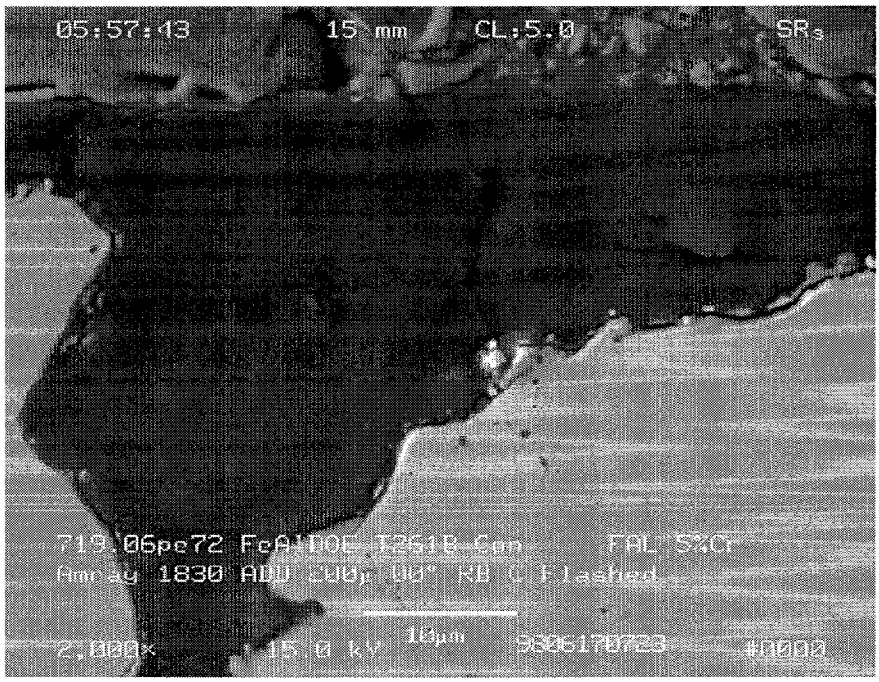

Figure 65: Cross-section of FAL control sample. Preoxidized for seven hours at 800°C.

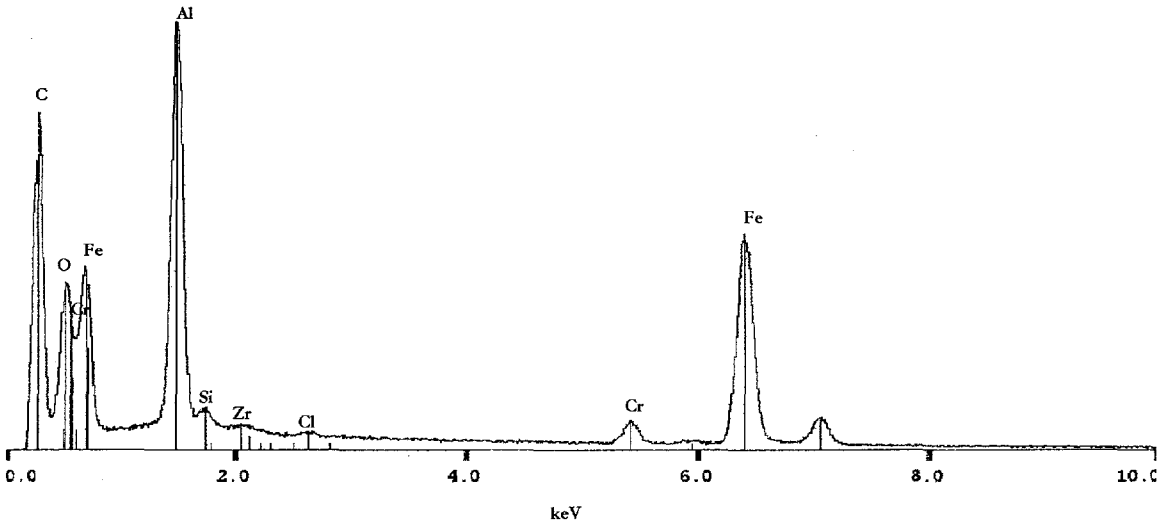

Figure 66: Partial field spectrum of base metal of Figure 65. High carbon is from carbon flashing.

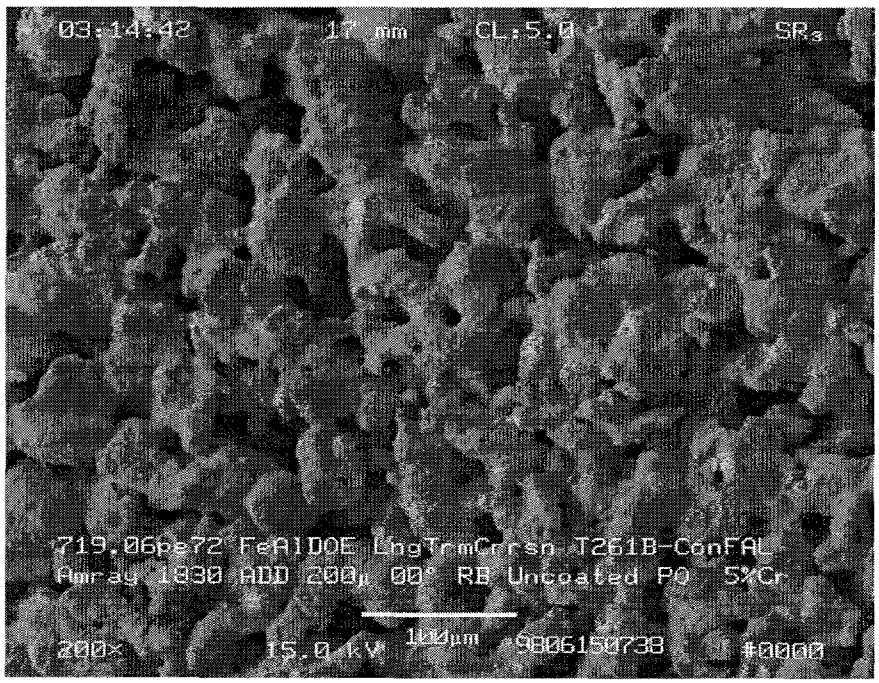

Figure 67: Upstream surface of FAL control sample. Preoxidized for seven hours at 800°C.

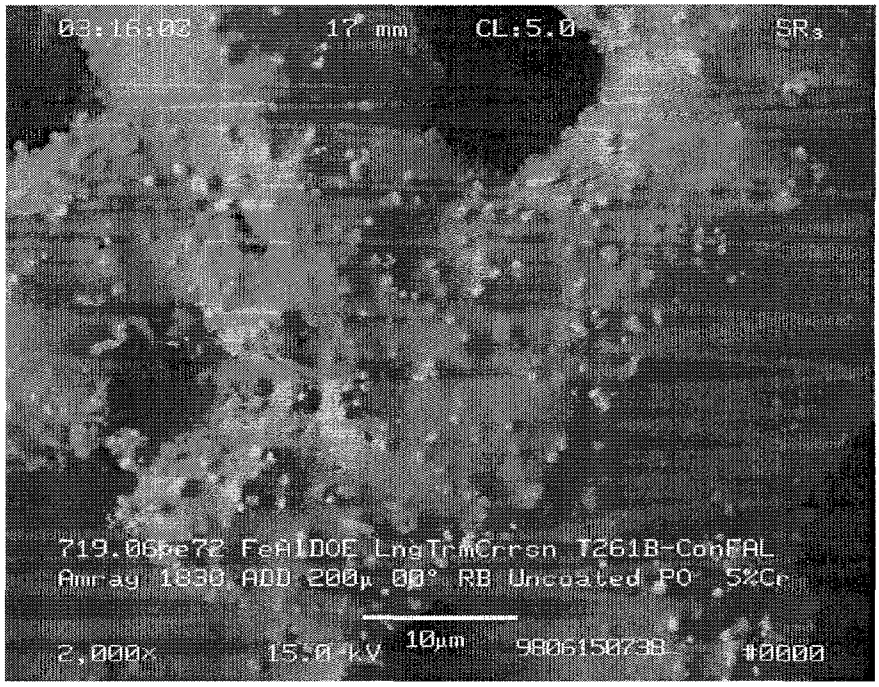

Figure 68: Upstream surface of FAL control sample. Preoxidized for seven hours at 800°C.

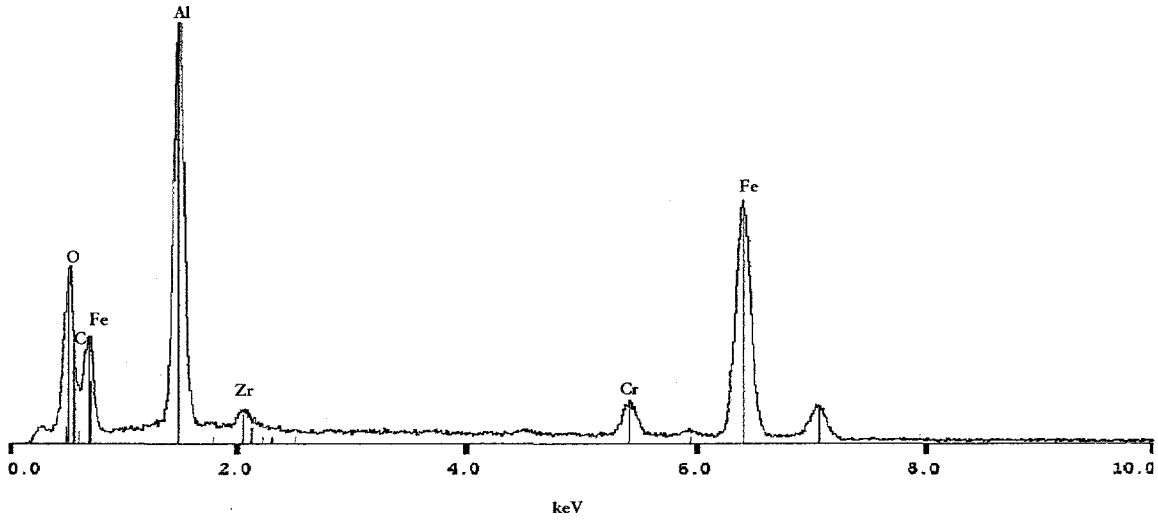

Figure 69: Full screen spectrum of Figure 68. Typical iron aluminide signature.

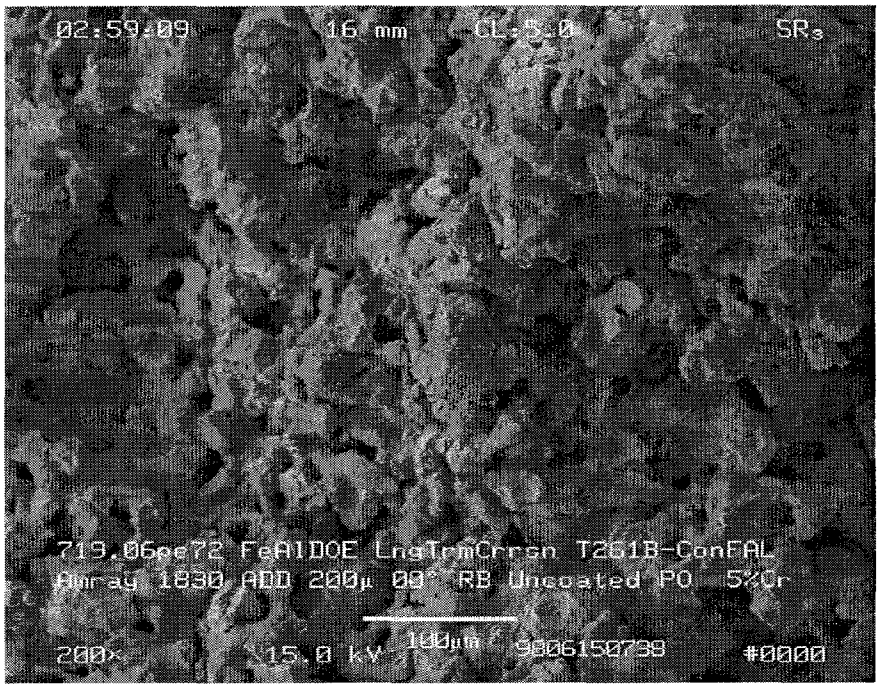

Figure 70: Fracture surface of FAL control sample. Preoxidized for seven hours at 800°C.

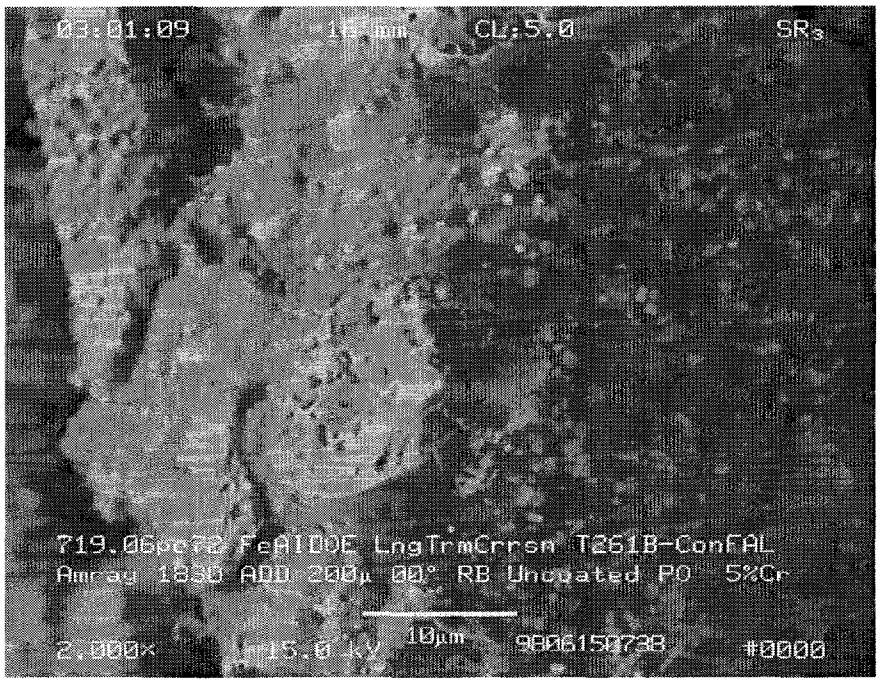

Figure 71: Fracture surface of FAL control sample. Preoxidized for seven hours at 800°C.

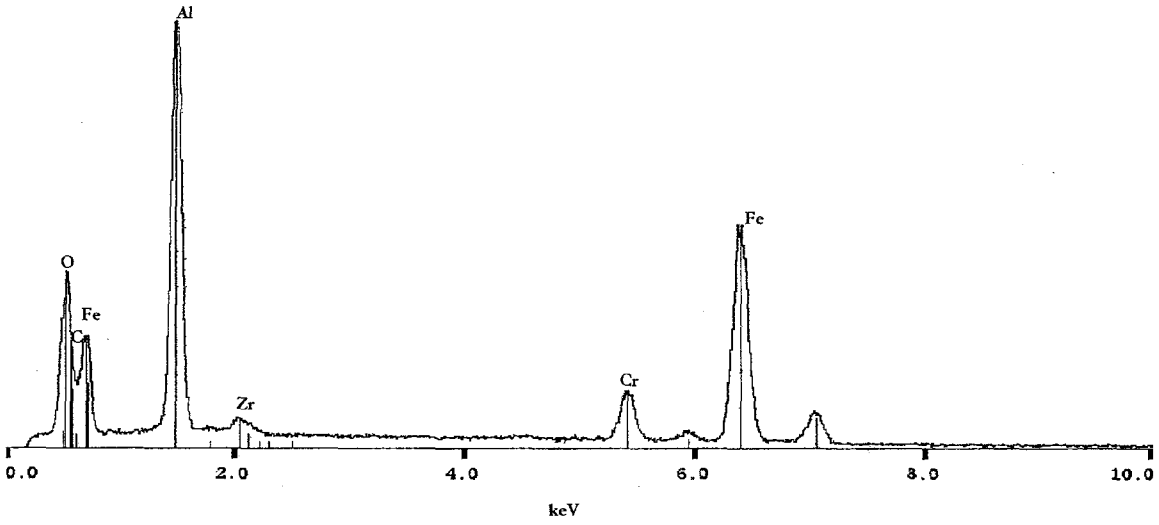

Figure 72: Full screen spectrum of Figure 71. Typical iron aluminide signature. Alumina layer is detected by the presence of oxygen.