**Chemical Composition of Eastern Kansas Limestone**
**by R.T. Runnels and J.A. Schleicher**
**Kansas Geological Survey, Bulletin 119, Part 3**
**Plate 2, Tables 13-19**

Chemical analysis, percent*

| Lab No. | Member | County | Thickness, ft. | Locality (a); sec. T. S., R. E. | Calc. $CaCO_3$ | Calc. $MgCO_3$ | Calc. $CaCO_3$ equiv. | CaO | MgO | LOI (b) | $SiO_2$ | $Al_2O_3$ (c) | $Fe_2O_3$ (d) | $K_2O$ | $Na_2O$ | $SO_3$ | S (e) | $P_2O_5$ | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Table 13, Topeka formation** | | | | | | | | | | | | | | | | | | | |
| 5380 | Coal Creek | Elk | 6 | NE 23-30-10 | 86.17 | 3.74 | 89.68 | 48.28 | 1.79 | 39.46 | 6.18 | 1.67 | 2.48 | 0.08 | 0.04 | nil | nil | Trace | 99.98 |
| 51311 | Curzon | Doniphan | 5 | SE 36-1-19 | 70.80 | 14.56 | 88.09 | 39.79 | 6.96 | 38.76 | 8.54 | 2.23 | 4.24 | | | 0.07 | | 0.06 | 100.65 |
| 51121 | Curzon | Jefferson | 13 | 19-8-18 | 87.45 | 4.23 | 94.16 | 49.42 | 2.02 | 41.43 | 3.52 | 0.08 | 2.20 | | | 0.56 | | 0.03 | 99.95 |
| 49454 | Curzon | Shawnee | 4 | 16-11-16 | 85.19 | 3.33 | 88.82 | 47.91 | 1.59 | 39.08 | 9.04 | 0.87 | 1.93 | | | nil | | 0.14 | 100.56 |
| 54369 | Curzon | Douglas | 3 | 11-12-17 | 91.38 | 0.61 | 92.04 | 51.27 | 0.79 | 40.50 | 4.66 | 1.62 | 1.15 | | | Trace | | 0.06 | 100.05 |
| 49387 | Curzon | Osage | 5.8 | 14-18-14 | 92.40 | 2.01 | 94.59 | 51.84 | 0.96 | 41.62 | 3.45 | 0.75 | 0.66 | | | Trace | | 0.06 | 99.34 |
| 49382 | Curzon | Osage | 6 | 27-15-15 | 93.90 | 0.98 | 93.59 | 52.75 | 0.47 | 41.18 | 3.61 | 0.81 | 1.22 | | | Trace | | 0.11 | 100.15 |
| 53211 | Hartford, Curzon | Shawnee | 13 | SW 4-13-16 | 76.44 | 7.32 | 85.86 | 43.03 | 3.50 | 37.78 | 10.12 | 2.06 | 2.64 | 0.25 | 0.12 | 0.11 | 0.07 | 0.10 | 99.71 |
| 51313 | Hartford | Doniphan | 5 | SE 36-1-19 | 78.98 | 6.29 | 88.39 | 44.43 | 3.01 | 38.89 | 9.12 | 1.72 | 2.82 | | | 0.10 | 0.08 | 0.08 | 100.17 |
| 49445 | Hartford | Shawnee | 3 | 16-11-16 | 83.60 | 4.58 | 88.61 | 47.05 | 2.19 | 38.99 | 5.40 | 1.51 | 5.53 | | | 0.14 | | 0.08 | 100.89 |
| 49383 | Hartford | Osage | 5 | 12-18-14 | 96.88 | 1.07 | 98.02 | 54.37 | 0.51 | 43.13 | 0.07 | 0.34 | 0.53 | | | nil | | 0.07 | 99.59 |
| 49388 | Hartford | Osage | 3.5 | 14-18-14 | 54.29 | 28.33 | 96.80 | 30.77 | 13.54 | 42.59 | 2.88 | 3.89 | 5.01 | | | 0.13 | | 0.20 | 99.01 |
| 49381 | Hartford | Osage | 5 | 14-18-14 | 97.18 | 1.11 | 97.89 | 54.56 | 0.53 | 43.07 | 0.82 | 0.25 | 0.67 | | | nil | | 0.08 | 99.98 |
| 5381 | Hartford | Elk | 4.1 | SW 12-30-10 | 31.36 | 2.13 | 3.86 | 17.62 | 1.02 | 15.30 | 61.21 | 2.28 | 2.07 | 0.29 | 0.11 | nil | 0.08 | 0.04 | 99.94 |
| **Table 14, Deer Creek formation** | | | | | | | | | | | | | | | | | | | |
| 51296 | Ervine Cr. | Doniphan | 15 | NW 2-2-20 | 88.35 | 4.81 | 94.00 | 49.64 | 2.53 | 41.36 | 3.63 | 1.35 | 1.41 | | | 0.12 | | 0.05 | 100.09 |
| 51118 | Ervine Cr. | Doniphan | 14 | NE 3-3-20 | 84.70 | 3.18 | 96.07 | 47.55 | 1.66 | 42.27 | 5.16 | 1.45 | 1.73 | | | 0.05 | 0.08 | 0.04 | 99.91 |
| 51316 | Ervine Cr. | Atchison | 14.5 | SW 11-5-19 | 81.06 | 9.25 | 95.07 | 45.53 | 4.20 | 41.83 | 4.17 | 1.09 | 2.76 | | | 0.10 | 0.16 | 0.03 | 99.93 |
| 51133 | Ervine Cr. | Jefferson | 12 | SE 5-9-18 | 88.81 | 7.13 | 93.95 | 49.88 | 3.41 | 41.34 | 2.47 | 0.73 | 1.56 | | | 0.04 | 0.04 | 0.07 | 99.50 |
| 49455 | Ervine Cr. | Shawnee | 10 | SE 14-11-16 | 93.56 | 1.07 | 93.93 | 52.53 | 0.51 | 41.33 | 4.08 | 0.87 | 1.37 | | | nil | | 0.08 | 100.77 |
| 49452 | Ervine Cr. | Douglas | 8 | SW 31-11-18 | 95.06 | 1.13 | 95.22 | 53.35 | 0.54 | 41.90 | 2.70 | 0.55 | 1.69 | | | Trace | | 0.07 | 100.80 |
| 53213 | Ervine Cr. | Shawnee | 6.9 | NW 4-12-17 | 92.83 | 1.36 | 93.25 | 52.05 | 0.65 | 41.03 | 3.54 | 0.87 | 1.65 | | | nil | Trace | 0.03 | 99.82 |
| 53214 | Ervine Cr. | Shawnee | 8.8 | SE 10-13-16 | 91.00 | 2.72 | 94.48 | 51.15 | 1.30 | 41.57 | 3.63 | 0.93 | 1.15 | | | 0.12 | 0.08 | 0.03 | 99.88 |
| 54223 | Ervine Cr. | Osage | 9.8 | NW 32-14-17 | 93.02 | 2.15 | 95.50 | 52.12 | 1.03 | 42.02 | 2.77 | 0.85 | 1.32 | | | Trace | | Trace | 100.11 |
| 51134 | Ervine Cr., Rock Bluff | Jefferson | 18 | SE 32-7-20 | 82.33 | 7.28 | 90.68 | 46.28 | 3.48 | 39.90 | 6.42 | 3.79 | | | | 0.12 | 0.16 | 0.06 | 100.05 |
| 49446 | Rock Bluff | Douglas | 3 | SW 32-11-18 | 82.87 | 7.62 | 91.98 | 46.48 | 3.64 | 40.47 | 3.49 | 1.25 | 5.06 | | | 0.15 | | Trace | 100.54 |
| 50554 | Ozawkie | Douglas | | 36-11-17 | 95.07 | | 95.18 | 53.27 | | 41.88 | 2.11 | 0.71 | 0.89 | | | nil | nil | Trace | 99.02 |
| 54222 | Ozawkie | Osage | 11.7 | NE 4-15-17 | 91.52 | 1.84 | 92.75 | 51.28 | 0.88 | 40.81 | 3.87 | 0.82 | 2.73 | | | Trace | | Trace | 100.39 |
| **Table 15, Lecompton Formation** | | | | | | | | | | | | | | | | | | | |
| 5382 | Beil | Elk | 9.5 | 21-30-11 | 64.86 | 4.14 | 71.02 | 36.38 | 1.98 | 31.25 | 22.38 | 4.26 | 2.77 | 0.36 | 0.13 | nil | nil | 0.03 | 99.54 |
| 53216 | Spr. Branch | Douglas | 6.8 | NW 36-11-17 | 73.94 | 12.41 | 90.91 | 41.63 | 5.93 | 40.00 | 6.29 | 1.55 | 4.22 | | | 0.10 | 0.01 | 0.08 | 99.80 |
| **Table 16, Oread formation** | | | | | | | | | | | | | | | | | | | |
| 51314 | Plattsmouth | Doniphan | 20 | NW 24-2-21 | 84.83 | 3.45 | 90.11 | 47.58 | 1.65 | 39.65 | 8.10 | 1.14 | 1.14 | | | nil | 0.04 | 0.04 | 99.30 |
| 51315 | Plattsmouth | Doniphan | 16.5 | SE 26-4-21 | 85.24 | 1.32 | 86.64 | 47.85 | 0.63 | 38.12 | 11.01 | 1.11 | 0.86 | | | nil | 0.02 | 0.07 | 99.65 |
| 51319 | Plattsmouth | Atchison | 12 | NW 13-5-21 | 91.34 | 1.46 | 94.57 | 51.24 | 0.70 | 41.61 | 3.52 | 0.92 | 1.78 | | | Trace | | 0.05 | 99.82 |
| 51120 | Plattsmouth | Atchison | 12 | SW 7-6-21 | 81.76 | 3.64 | 86.68 | 46.27 | 1.74 | 38.14 | 10.96 | 1.27 | 1.28 | | | 0.51 | 0.22 | 0.08 | 100.25 |
| 51131 | Plattsmouth | Leavenworth | 15 | SE 14-9-21 | 88.99 | 0.61 | 90.07 | 50.00 | 0.29 | 39.63 | 7.96 | 1.03 | 0.84 | | | 0.12 | | 0.05 | 99.92 |
| 51276 | Plattsmouth | Leavenworth | 13 | NW 6-11-21 | 84.79 | 4.54 | 91.25 | 47.64 | 2.17 | 40.15 | 6.62 | 2.19 | 1.53 | | | 0.02 | 0.12 | 0.09 | 100.41 |
| 51132 | Plattsmouth | Jefferson | 18 | 21-11-17 | 81.44 | 5.44 | 89.55 | 46.08 | 2.60 | 39.40 | 8.23 | 1.07 | 1.57 | | | 0.49 | | 0.08 | 99.52 |
| 51438 | Plattsmouth | Douglas | 14 | NE 1-12-19 | 81.55 | 1.53 | 84.95 | 45.69 | 0.73 | 37.38 | 13.94 | 0.92 | 1.83 | | | Trace | | Trace | 100.49 |
| 52367 | Plattsmouth | Douglas | 8 | SW 25-12-19 | 88.40 | 1.05 | 90.02 | 59.58 | 0.50 | 39.61 | 7.59 | 1.04 | 1.01 | | | nil | nil | 0.04 | 99.37 |
| 53217 | Plattsmouth | Douglas | 14.5 | NE 32-12-18 | 90.79 | 0.65 | 92.30 | 50.94 | 0.31 | 40.61 | 5.89 | 0.87 | 1.07 | | | Trace | 0.04 | 0.06 | 99.72 |
| 53212 | Plattsmouth | Douglas | 11 | SW 4-13-19 | 87.83 | 1.59 | 90.52 | 49.39 | 0.76 | 39.83 | 7.62 | 0.93 | 1.01 | | | 0.06 | 0.08 | 0.10 | 99.71 |
| 54370 | Plattsmouth | Douglas | 10.3 | NE 22-14-18 | 89.83 | 2.03 | 91.64 | 50.44 | 0.97 | 40.32 | 6.41 | 1.44 | 0.44 | | | 0.13 | | 0.02 | 100.17 |
| 54224 | Plattsmouth | Osage | 20.2 | SW 3-18-16 | 8.32 | 4.50 | 93.73 | 49.59 | 2.15 | 41.24 | 3.89 | 1.04 | 1.32 | | | 0.16 | 0.20 | Trace | 99.39 |
| 52278 | Plattsmouth | Coffey | 13 | NW 14-21-15 | 89.11 | 4.02 | 93.73 | 49.99 | 1.92 | 41.24 | 4.04 | 1.14 | 1.29 | | | nil | 0.12 | 0.05 | 99.67 |
| 52316 | Plattsmouth | Coffey | 12 | SE 2-22-15 | 85.24 | 3.43 | 90.16 | 47.85 | 1.64 | 39.67 | 6.48 | 1.41 | 2.77 | | | nil | nil | 0.07 | 99.89 |
| 52205 | Plattsmouth | Wilson | 3 | SW 23-27-13 | 92.97 | 1.99 | 93.91 | 52.09 | 0.95 | 14.32 | 3.64 | 1.50 | 1.21 | 0.13 | 0.01 | nil | | Trace | 100.85 |
| 53174 | Plattsmouth | Greenwood | 7.1 | NE 3-28-12 | 91.29 | 2.68 | 94.75 | 51.24 | 1.28 | 41.69 | 3.36 | 1.04 | 1.30 | | | 0.05 | 0.06 | 0.05 | 99.99 |
| 52295 | Plattsmouth | Greenwood | 7 | SW 11-28-12 | 94.61 | 1.46 | 96.05 | 53.01 | 0.70 | 42.26 | 2.48 | 0.18 | 1.38 | | | nil | nil | Trace | 100.01 |
| 52361 | Plattsmouth | Elk | 9 | SE 21-29-13 | 96.06 | 1.97 | 96.98 | 53.83 | 0.94 | 42.67 | 1.62 | 0.51 | 0.62 | | | nil | Trace | 0.01 | 100.20 |
| 5377 | Plattsmouth | Elk | 12 | NE 3-30-12 | 94.32 | 1.15 | 95.66 | 52.89 | 0.55 | 42.09 | 2.63 | 0.74 | 0.67 | 0.03 | 0.03 | nil | nil | 0.03 | 99.66 |
| 52270 | Plattsmouth | Chautauqua | 20 | 33-33-11 | 93.40 | 3.22 | 97.66 | 52.33 | 1.54 | 42.97 | 1.15 | 0.39 | 1.55 | | | nil | nil | Trace | 99.93 |
| 51317 | Leavenworth | Doniphan | 1.5 | NW 13-5-21 | 89.92 | 1.53 | 90.73 | 50.56 | 0.73 | 39.82 | 5.86 | 1.04 | 1.97 | | | 0.23 | 0.61 | 0.02 | 100.33 |
| 52200 | Leavenworth | Wilson | 1.4 | SW 23-27-13 | 91.00 | 4.06 | 95.05 | 50.99 | 1.94 | 41.82 | 1.83 | 1.10 | 1.42 | 0.09 | 0.02 | nil | 0.14 | Trace | 99.35 |
| 51318 | Toronto | Atchison | 2.8 | NW 13-5-21 | 82.03 | 6.34 | 89.98 | 45.96 | 3.03 | 39.59 | 3.69 | 2.03 | 5.50 | | | nil | | Trace | 99.81 |
| 5110 | Toronto | Leavenworth | 8 | 7-11-21 | 76.05 | 10.52 | 91.39 | 42.72 | 5.03 | 40.21 | 6.08 | 0.89 | 4.71 | | | 0.06 | | 0.05 | 99.75 |
| 52358 | Toronto | Douglas | 8 | SW 25-12-19 | 78.78 | 7.03 | 87.84 | 44.19 | 3.36 | 38.65 | 8.26 | 1.32 | 3.97 | | | nil | nil | 0.04 | 99.79 |
| 4766 | Toronto | Douglas | 3 | SE 36-12-19 | 68.89 | 19.64 | 96.50 | 38.60 | 9.39 | 42.46 | 3.22 | 0.61 | 5.10 | | | Trace | | nil | 99.58 |
| 54372 | Toronto | Duglas | 3.6 | NW 35-13-19 | 93.38 | 1.15 | 93.75 | 52.34 | 0.55 | 41.25 | 3.48 | 1.17 | 1.08 | | | nil | | 0.02 | 99.89 |
| 54371 | Toronto | Douglas | 4.2 | SE 19-14-20 | 94.77 | 1.13 | 95.16 | 53.11 | 0.54 | 41.87 | 3.16 | 0.82 | 0.54 | | | nil | | 0.01 | 100.05 |
| 52328 | Toronto | Woodson | 7.2 | NW 35-25-13 | 87.56 | 1.95 | 91.02 | 49.13 | 0.93 | 40.05 | 5.99 | 1.24 | 2.18 | | | nil | 0.23 | 0.06 | 99.58 |
| 52294 | Toronto | Greenwood | 9 | NW 10-26-13 | 89.36 | 1.51 | 91.66 | 50.13 | 0.72 | 40.33 | 4.77 | 0.93 | 2.98 | | | nil | nil | 0.05 | 99.91 |
| 52204 | Toronto | Wilson | 4 | 23-27-13 | 89.63 | 2.28 | 91.52 | 50.22 | 1.09 | 40.27 | 5.65 | 1.76 | 1.24 | 0.18 | 0.03 | nil | | Trace | 100.44 |
| **Table 17, Douglas Group** | | | | | | | | | | | | | | | | | | | |
| 5151 | Amazonia | Doniphan | Spot | SW 33-3-22 | 96.50 | 1.15 | 98.11 | 54.12 | 0.55 | 43.17 | 1.13 | 0.45 | 0.66 | | | | | 0.04 | 100.12 |
| 51119 | Amazonia | Doniphan | 10 | SW 33-3-22 | 92.58 | 1.49 | 95.51 | 52.02 | 0.71 | 42.03 | 1.71 | 0.60 | 2.63 | | | 0.19 | | 0.02 | 99.91 |
| 51312 | Amazonia | Doniphan | 9 | NE 15-3-22 | 94.43 | 2.76 | 95.84 | 52.97 | 1.32 | 42.17 | 1.39 | 0.57 | 1.86 | | | 0.01 | | 0.04 | 100.33 |
| 52346 | Amazonia | Woodson | 1 | 36-25-13 | | | | | | | | | | | | | | | |
| 52384 | Haskell | Woodson | 3 | SE 28026015 | 92.93 | 1.84 | 96.43 | 52.20 | 0.88 | 42.43 | 2.15 | 0.72 | 1.37 | 0.04 | 0.07 | nil | nil | 0.10 | 99.96 |
| 52329 | Haskell | Woodson | 1.5 | SW 29-26-15 | 93.18 | 1.90 | 96.43 | 52.33 | 0.91 | 42.43 | 1.95 | 0.54 | 1.39 | 0.04 | 0.06 | 0.09 | 0.05 | 0.06 | 99.71 |
| 52338 | Haskell | Wilson | 1 | NW 5-27-14 | 91.38 | 2.07 | 93.89 | 51.27 | 0.99 | 41.31 | 3.92 | 1.21 | 1.27 | 0.12 | 0.07 | Trace | Trace | 0.06 | 100.22 |
| 52347 | Haskell | Wilson | 6 | SW 19-28-14 | 87.49 | 2.22 | 91.45 | 49.08 | 1.06 | 40.24 | 5.24 | 1.62 | 2.05 | 0.16 | 0.07 | nil | 0.08 | 0.05 | 99.57 |
| 51291 | Haskell | Wilson | 4 | 19-28-14 | 86.76 | 2.30 | 88.91 | 48.71 | 1.10 | 39.12 | 6.90 | 1.94 | 1.96 | | | 0.04 | nil | 0.06 | 99.83 |
| 5374 | Haskell | Elk | 1.3 | NE 21-31-13 | 94.02 | 2.57 | 95.64 | 52.75 | 1.23 | 42.08 | 1.70 | 0.71 | 1.44 | 0.03 | 0.04 | nil | nil | 0.06 | 100.04 |
| 52355 | Westphalia | Coffey | 10 | NW 31-21-16 | 86.31 | 2.55 | 88.00 | 48.36 | 1.22 | 38.72 | 6.83 | 1.36 | 3.62 | | | nil | Trace | Trace | 100.11 |
| 52322 | Westphalia | Woodson | 3.5 | NW 1-25-15 | 28.02 | | | 15.82 | 0.90 | 14.33 | 57.55 | 3.14 | 7.03 | 0.68 | 0.46 | nil | | 0.09 | 100.00 |
| 52335 | Westphalia | Wilson | 3 | NW 17-27-14 | 81.21 | 3.72 | 86.82 | 45.50 | 1.78 | 38.20 | 8.22 | 2.00 | 3.67 | 0.28 | 0.10 | nil | 0.10 | Trace | 99.77 |
| 52300 | Westphalia | Wilson | 5 | SW 19-28-14 | 71.94 | 11.46 | 89.61 | 40.32 | 5.48 | 39.43 | 7.50 | 1.63 | 5.26 | 0.17 | 0.11 | nil | nil | 0.01 | 99.91 |
| 51293 | Westphalia | Wilson | 5 | 19-28-14 | 74.76 | 10.00 | 88.75 | 42.00 | 4.78 | 39.05 | 8.13 | 1.88 | 3.90 | | | 0.05 | 0.01 | 0.06 | 99.85 |
| **Table 18, Stanton formation** | | | | | | | | | | | | | | | | | | | |
| 52317 | South Bend | Woodson | 6 | NE 32-25-17 | 83.83 | 1.74 | 87.43 | 47.04 | 0.83 | 38.47 | 7.84 | 2.76 | 2.39 | 0.03 | 0.07 | 0.10 | nil | 0.07 | 99.60 |
| 5111 | Stoner | Wyandotte | 12 | SW 36-10-23 | 91.50 | 2.79 | 95.04 | 51.35 | 1.30 | 41.82 | 3.15 | 0.88 | 1.32 | | | 0.06 | 0.01 | 0.03 | 99.91 |
| 5112 | Stoner | Douglas | 14 | NE 4-13-21 | 93.93 | 1.71 | 96.59 | 52.79 | 0.82 | 42.50 | 2.11 | 0.52 | 0.63 | | | 0.08 | 0.06 | 0.04 | 99.49 |
| 52135 | Stoner | Douglas | 17 | SE 18-13-21 | 95.09 | 1.86 | 96.09 | 53.29 | 0.89 | 42.28 | 2.17 | 0.73 | 0.56 | | | Trace | | 0.01 | 99.93 |
| 53170 | Stoner | Douglas | 15.3 | SE 15-13-21 | 93.70 | 1.51 | 94.07 | 52.51 | 0.72 | 41.39 | 3.23 | 0.97 | 0.88 | | | Trace | 0.05 | 0.01 | 99.71 |
| 53215 | Stoner | Douglas | 13.2 | NW 20-13-21 | 88.26 | 4.66 | 95.39 | 49.49 | 2.23 | 41.97 | 3.01 | 1.46 | 1.35 | | | nil | 0.07 | 0.03 | 99.54 |
| 49281 | Stoner | Johnson | 7 | NE 3-14-23 | 93.50 | 2.64 | 95.59 | 52.65 | 1.26 | 42.06 | 2.78 | 0.81 | 0.82 | | | 0.17 | | 0.10 | 100.60 |
| 53187 | Stoner | Johnson | 12 | NE 3-14-23 | 90.43 | 2.70 | 93.70 | 50.80 | 1.29 | 41.23 | 3.85 | 1.13 | 0.86 | | | 0.09 | 0.14 | 0.01 | 99.26 |
| 53178 | Stoner | Johnson | 15.3 | NW 13-14-22 | 93.36 | 1.63 | 95.11 | 52.34 | 0.78 | 41.85 | 3.26 | 0.86 | 0.67 | | | 0.04 | 0.10 | Trace | 99.88 |
| 52271 | Stoner | Miami | 13 | NW 35-15-21 | 92.61 | 2.36 | 94.75 | 51.89 | 1.13 | 41.69 | 3.43 | 0.82 | 1.04 | | | nil | nil | Trace | 100.00 |
| 5190 | Stoner | Miami | 14 | NE 1-16-21 | 93.24 | 1.44 | 94.09 | 52.35 | 0.69 | 41.40 | 3.65 | 0.79 | 0.66 | | | 0.06 | Trace | 0.06 | 99.66 |
| 518 | Stoner | Miami | 14 | NE 1-16-21 | 94.34 | 1.09 | 95.80 | 52.94 | 0.52 | 42.15 | 2.73 | 0.88 | 0.70 | | | 0.06 | 0.01 | 0.03 | 100.01 |
| 53186 | Stoner | Franklin | 11.5 | SW 22-16-20 | 92.06 | 1.80 | 94.14 | 51.63 | 1.16 | 41.42 | 3.84 | 1.14 | 0.74 | | | 0.06 | Trace | Trace | 99.99 |
| 49223 | Stoner | Franklin | 12 | SW 6-17-19 | 96.32 | 1.07 | 96.59 | 53.97 | 0.51 | 42.50 | 1.72 | 0.39 | 0.50 | | | Trace | | Trce | 99.59 |
| 53175 | Stoner | Franklin | 10.5 | NE 23-18-19 | 92.15 | 1.67 | 92.66 | 51.67 | 0.80 | 40.77 | 4.23 | 0.89 | 1.13 | | | nil | 0.06 | 0.03 | 99.52 |
| 53198 | Stoner | Franklin | 22 | NW 33-18-21 | 93.97 | | 93.86 | 52.70 | Trace | 41.30 | 5.22 | 0.17 | 0.71 | | | Trace | nil | 0.04 | 100.14 |
| 52369 | Stoner | Anderson | 9 | SW 31-19-19 | 94.66 | 2.01 | 96.18 | 53.04 | 0.96 | 42.32 | 2.23 | 0.53 | 1.06 | | | nil | nil | Trace | 100.14 |
| 52364 | Stoner | Anderson | 23 | SE 34-20-19 | 87.45 | 4.35 | 94.95 | 49.06 | 2.08 | 40.46 | 5.43 | 1.47 | 1.21 | | | Trace | 0.18 | 0.05 | 99.96 |
| 52336 | Stoner | Woodson | 4 | SE 32-26-16 | 88.04 | 1.61 | 91.32 | 49.37 | 0.77 | 40.18 | 6.94 | 0.73 | 1.99 | | | nil | nil | 0.03 | 100.01 |
| 5191 | Stoner | Wilson | 40 | NW 19-29-15 | 85.22 | 4.48 | 89.64 | 47.89 | 2.14 | 39.44 | 6.33 | 2.61 | 1.05 | | | 0.04 | 0.14 | 0.08 | 99.58 |
| 51292 | Stoner | Wilson | 4 | SE 25-30-14 | 97.50 | 1.11 | 97.27 | 54.73 | 0.53 | 42.80 | 1.21 | 0.74 | 0.40 | | | 0.03 | nil | 0.06 | 100.50 |
| 52289 | Stoner | Montgomery | 10.5 | NE 15-32-14 | 93.88 | 1.55 | 95.75 | 52.64 | 0.74 | 42.13 | 2.32 | 0.91 | 0.56 | | | Trace | Trace | 0.03 | 99.33 |
| 53193 | Captain Cr. | Johnson | 4.5 | NE 7-12-24 | 95.18 | 1.07 | 96.36 | 53.37 | 0.51 | 42.40 | 2.17 | 0.40 | 0.80 | | | Trace | Trace | 0.03 | 99.68 |
| 49220 | Captain Cr. | Franklin | 14 | SW 6-17-19 | 87.83 | 5.12 | 94.39 | 49.58 | 2.45 | 41.53 | 3.43 | 0.91 | 1.38 | | | 0.33 | | 0.11 | 99.72 |
| 49221 | Captain Cr. | Franklin | 10 | SW 6-17-19 | 89.93 | 4.37 | 95.52 | 50.90 | 2.09 | 42.03 | 2.31 | 0.54 | 1.46 | | | 0.51 | | 0.12 | 99.96 |
| 53199 | Captain Cr. | Franklin | 10.3 | SW 6-17-19 | 87.02 | 5.79 | 94.91 | 48.97 | 2.77 | 41.76 | 3.27 | 1.00 | 1.32 | | | 0.14 | 0.13 | 0.03 | 99.23 |
| 52351 | Captain Cr. | Allen | 16 | SW 4-24-19 | 89.65 | 2.53 | 92.23 | 50.27 | 1.21 | 40.58 | 4.95 | 1.42 | 0.89 | | | Trace | 0.08 | 0.03 | 99.32 |
| 52305 | Captain Cr. | Allen | 6 | NW 20-24-18 | 94.56 | 1.07 | 97.48 | 52.98 | 0.51 | 42.89 | 1.06 | 0.30 | 1.37 | | | nil | nil | Trace | 99.11 |
| 52288 | Captain Cr. | Montgomery | 12.5 | NW 8-32-15 | 95.72 | 0.96 | 96.75 | 53.66 | 0.46 | 42.57 | 1.56 | 0.55 | 0.73 | | | nil | nil | 0.02 | 99.55 |
| **Table 19, Plattsburg formation** | | | | | | | | | | | | | | | | | | | |
| 50350 | Spring Hill | Leavenworth | 18 | SW 13-12-22 | 86.86 | 2.28 | 89.84 | 49.03 | 1.09 | 39.53 | 7.03 | 1.02 | 0.84 | | | 0.42 | | 0.06 | 99.02 |
| 49280 | Spring Hill | Leavenworth | 6 | SW 13-12-22 | 80.42 | 1.53 | 82.61 | 45.25 | 0.73 | 36.35 | 13.59 | 3.05 | 1.44 | | | 0.14 | | 0.10 | 100.65 |
| 53167 | Spring Hill | Johnson | 12.2 | SE 27-13-23 | 90.81 | 2.18 | 93.61 | 50.92 | 1.04 | 41.19 | 4.35 | 0.81 | 1.16 | | | Trace | 0.04 | 0.03 | 99.50 |
| 53188 | Spring Hill | Johnson | 11.1 | SW 8-15-23 | 96.31 | 1.74 | 97.52 | 54.03 | 0.83 | 42.91 | 0.59 | 0.27 | 0.88 | | | nil | 0.06 | 0.05 | 99.56 |
| 53191 | Spring Hill | Franklin | 17.2 | NW 12-17-19 | 85.12 | 4.08 | 89.66 | 47.73 | 1.95 | 39.45 | 6.70 | 2.08 | 1.27 | | | Trace | 0.11 | 0.03 | 99.18 |
| 52360 | Spring Hill | Linn | 22 | NW 23-19-21 | 92.90 | 2.68 | 95.82 | 52.05 | 1.28 | 42.16 | 2.12 | 0.72 | 1.16 | | | nil | 0.07 | Trace | 99.49 |
| 5113 | Spring Hill | Anderson | 16 | SW 12-20-19 | 95.13 | 2.49 | 98.27 | 53.37 | 1.19 | 43.24 | 0.99 | 0.58 | 0.71 | | | 0.01 | 0.05 | 0.04 | 100.13 |
| 49379 | Spring Hill | Anderson | 19.3 | SW 29-20-21 | 98.27 | 0.90 | 97.73 | 55.06 | 0.43 | 43.00 | 0.68 | 0.64 | 0.49 | | | nil | | Trace | 100.30 |
| 5192 | Spring Hill | Wilson | 50 | NW 18-30-16 | 90.18 | 3.10 | 93.88 | 50.65 | 1.48 | 41.27 | 3.95 | 1.32 | 0.80 | | | 0.04 | 0.08 | 0.07 | 99.53 |
| 52348 | Spring Hill | Wilson | 65 | NW 18-30-16 | 88.54 | 3.66 | 92.66 | 49.65 | 1.75 | 40.77 | 4.80 | 1.73 | 1.09 | 0.22 | 0.06 | 0.06 | 0.10 | Trace | 100.13 |
| 52284 | Spring Hill | Montgomery | 7 | NW 28-31-15 | 97.54 | 0.65 | 97.23 | 54.65 | 0.31 | 42.78 | 1.10 | 0.36 | 0.61 | | | nil | nil | nil | 99.81 |
| 48162 | Merriam | Wyandotte | 3 | 23-11-23 | 95.66 | 0.42 | 96.09 | 53.60 | 0.20 | 42.28 | 1.30 | 0.85 | 1.80 | | | | | | 100.02 |
| 49277 | Merriam | Leavenworth | 4.5 | SW 13-12-22 | 49.28 | 31.09 | 89.02 | 28.18 | 14.46 | 39.17 | 10.89 | 2.71 | 3.28 | | | 0.61 | | 0.10 | 99.80 |
| 48164 | Merriam | Anderson | 3 | SW 29-20-21 | 94.95 | 0.50 | 97.11 | 53.20 | 0.24 | 42.73 | 1.26 | 0.67 | 0.94 | | | | | | 99.04 |
| 52345 | Merriam | Wilson | 1.5 | SW 18-29-16 | 76.38 | 3.41 | 82.50 | 43.01 | 1.63 | 36.30 | 11.57 | 3.90 | 2.66 | 0.62 | 0.17 | 0.16 | 0.13 | 0.08 | 100.10 |

Spectrochemical analysis, percent *

| B | Zn | Ni | Mo | Cr | Ag | Ba | Pb | Sn | Cu | V | Mn | Ti | Sr | Lab. No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0.0001 | | 0.0003 | | | | | 0.0005 | 0.001 | 0.15 | 0.006 | | 5380 |
| | | | | | | | 0.0005 | | 0.001 | | 0.6 | 0.001 | 0.023 | 51311 |
| 0.0005 | 0.0007 | 0.0005 | 0.0002 | 0.0003 | 0.00007 | 0.02 | 0.001 | | 0.00003 | 0.002 | 0.023 | 0.065 | 0.048 | 51121 |
| | | 0.0001 | | | | | | | 0.00003 | 0.0025 | 0.04 | 0.002 | | 49454 |
| | | | | | | | | | | | | | | 54369 |
| | | | | | | | | | 0.000015 | 0.0026 | 0.095 | 0.002 | 0.011 | 49387 |
| | | | | | | | | | | | | | | 49382 |
| | | 0.0005 | | | | | | | 0.0001 t | | 0.05 | 0.007 | | 53211 |
| 0.0025 | | 0.0005 | 0.00005 | | | | 0.001 | | 0.00004 | 0.0012 | 0.085 | 0.05 | 0.064 | 51313 |
| | | 0.001 | | | 0.00005 | | 0.015 | | 0.0005 | 0.003 | 0.3 | 0.002 | | 49445 |
| | | | | | | | | | | | | | | 49383 |
| | | | | | | | | | | | | | | 49388 |
| | | | | | | | | | 0.000025 | 0.002 | 0.21 | 0.002 | 0.067 | 49381 |
| | | 0.001 | | 0.015 | | 0.002 | 0.0005 | 0.003 | 0.0005 | 0.04 | 0.03 | 0.005 | | 5381 |
| | | 0.001 | | 0.0003 | 0.00005 | | | 0.001 | 0.001 | 0.01 | 0.06 | 0.004 | | 51296 |
| | | 0.001 | | | 0.00005 | | 0.0005 | | 0.0002 | 0.003 | 0.2 | 0.002 | | 51118 |
| | | | | | | | | | 0.000025 | 0.001 | 0.13 | 0.03 | | 51316 |
| | 0.001 | | | | | | | | 0.000025 | 0.0016 | 0.008 | 0.05 | 0.045 | 51133 |
| | | 0.0004 | | | | | | | 0.00003 | 0.005 | 0.1 | 0.004 | | 49455 |
| | | 0.0005 | 0.0005 | | 0.00001 | 0.01 | 0.0002 | | 0.000025 | 0.0044 | 0.12 | 0.0015 | 0.029 | 49452 |
| 0.001 | | 0.002 | | 0.0003 | 0.00005 | | 0.0015 | | 0.0001 | 0.002 | 0.04 | 0.004 | | 53213 |
| | | 0.0005 | | 0.0003 | | | 0.0003 | 0.0005 | 0.00005 | 0.0025 | 0.1 | 0.01 | | 53214 |
| | | 0.002 | | 0.0005 | | | | | 0.0001 | 0.005 | 0.05 | 0.02 | | 54223 |
| | | | | | | | | | 0.003 | 0.01 | 0.03 | 0.006 | | 51134 |
| 0.001 | | 0.001 | 0.001 | 0.001 | 0.00005 | 0.01 | 0.003 | 0.001 | 0.0001 | 0.005 | 0.5 | 0.015 | | 49446 |
| | | 0.001 | | 0.0003 | | t | | | 0.00002 | 0.0022 | 0.12 | 0.003 | | 50554 |
| | | 0.005 | | 0.003 | | | | | 0.00005 | 0.04 | 0.045 | 0.005 | | 54222 |
| 0.003 | | 0.005 | | 0.001 | 0.0001 | | | | 0.0001 | 0.001 | 0.25 | 0.008 | | 5382 |
| | | 0.0005 | | | 0.0001 | | 0.0005 | 0.0005 | 0.001 | 0.002 | 0.1 | 0.1 | | 53216 |
| | | 0.0005 | t | | | | | | 0.00002 | 0.0013 | 0.041 | 0.02 | | 51314 |
| | | 0.0004 | | 0.0002 | | | 0.0003 | | 0.00004 | 0.0014 | 0.021 | 0.02 | 0.037 | 51315 |
| 0.00005 | 0.0005 | 0.005 | 0.0005 | 0.0003 | 0.00004 | 0.015 | 0.0003 | | 0.000025 | 0.0036 | 0.12 | 0.025 | 0.06 | 51319 |
| 0.0002 | | 0.003 | 0.00007 t | | | | 0.002 | | 0.00004 | 0.0016 | 0.017 | 0.01 | | 51120 |
| | | 0.001 | | 0.001 | 0.00005 | | 0.0005 | | 0.0002 | 0.002 | 0.04 | 0.004 | | 51131 |
| | | 0.0007 | | | 0.0003 | | 0.0005 | | 0.00005 | | 0.05 | 0.0015 | | 51276 |
| 0.0025 | | 0.0007 | 0.0003 | | 0.00025 | | 0.0025 | | 0.00004 | 0.0014 | 0.026 | 0.02 | | 51132 |
| 0.0005 | | 0.0007 | | 0.0003 | 0.00005 | 0.005 | 0.001 | | 0.00009 | 0.0011 | 0.01 | 0.05 | 0.029 | 51438 |
| | | 0.001 | | | | | | | 0.000013 | 0.0025 | 0.05 | 0.01 | | 52367 |
| | | | | | | | | | 0.0001 | 0.0025 | 0.006 | 0.004 | 0.058 | 53217 |
| | | 0.0005 | | 0.0005 | 0.00003 | | | | 0.0001 | 0.003 | 0.1 | 0.005 | | 53212 |
| | | | | | | | | | | | | | | 54370 |
| | | 0.001 | | 0.0005 | | | | | 0.00005 | 0.01 | 0.05 | 0.02 | | 54224 |
| | | 0.002 | 0.0002 | | 0.0005 | | 0.005 | 0.003 | 0.0001 | 0.0025 | 0.05 | 0.002 | | 52278 |
| | | 0.0005 | | | | | | | 0.000018 | 0.0025 | 0.03 | 0.005 | | 52316 |
| | | 0.0001 | | 0.0003 | | 0.002 | | | 0.0002 | 0.003 | 0.2 | 0.003 | | 52205 |
| | | 0.001 | | 0.0005 | | 0.01 | 0.0005 | | 0.00005 | 0.0005 | 0.07 | 0.003 | | 53174 |
| | | 0.001 | 0.0005 | 0.0003 | 0.00005 | | 0.0005 | | 0.00002 | 0.005 | 0.005 | 0.01 | | 52295 |
| | | 0.0005 | | | | | | | 0.000013 | 0.015 | 0.05 | | | 52361 |
| | | 0.00005 | | | | | | | 0.001 | 0.007 | 0.1 | | 0.046 | 5377 |
| | | 0.001 | | | 0.00005 | 0.1 | 0.0002 | | 0.00002 | 0.015 | 0.25 t | | 0.013 | 52270 |
| | | | | | | | 0.0005 | | 0.001 | | 0.6 | 0.001 | 0.023 | 51317 |
| | | 0.0002 | 0.0001 | 0.0004 | | 0.02 | | | 0.005 | 0.005 | 0.3 | 0.004 | | 52200 |
| | | | | | | | | | | | | | | 51318 |
| | | | | | | | | | | | | | | 5110 |
| 0.001 | | 0.001 | | | | | | | 0.00002 | 0.01 | 0.15 | 0.009 | | 52358 |
| | | | | | | | | | | | | | | 4766 |
| | | | | | | | | | | | | | | 54372 |
| | | | | | | | | | | | | | | 54371 |
| | | 0.001 | | | | | | | 0.00003 | 0.0025 | 0.2 | 0.02 | | 52328 |
| | | 0.001 | 0.0003 | | 0.00005 | 0.01 | | | 0.00004 | 0.005 | 0.06 | 0.002 | 0.037 | 52294 |
| | | | | | | | | | 0.000025 | 0.003 | 0.3 | 0.002 | 0.072 | 52204 |
| | | | | | | | | | | | | | | 5151 |
| | | 0.003 | | | | 0.05 | | | 0.000013 | 0.002 | 0.14 | 0.001 | | 51119 |
| | | | | 0.0002 | | | | | 0.0005 | 0.002 | 0.25 | 0.001 | 0.0036 | 51312 |
| 0.01 | | 0.003 | 0.0002 | 0.009 | 0.0001 | | 0.002 | 0.0015 | 0.00007 | | 0.4 | 0.014 | | 52346 |
| 0.005 | | 0.001 | 0.0001 | 0.01 | 0.00005 | | 0.003 | 0.002 | 0.000035 | 0.002 | 0.3 | 0.015 | | 52384 |
| | | 0.001 | | | | | 0.005 | 0.0007 | 0.00004 | 0.001 | 0.1 | 0.015 | | 52329 |
| 0.001 | | 0.002 | | | 0.00005 | 0.15 | 0.008 | 0.003 | 0.000015 | 0.001 | 0.15 | 0.003 | 0.05 | 52338 |
| 0.0008 | | 0.001 | | | 0.00005 | 0.02 | 0.0015 | 0.0015 | 0.000015 | 0.002 | 0.2 | 0.002 | 0.061 | 52347 |
| | | | | | | | | | | | | | | 51291 |
| | | 0.004 | | | 0.00005 | | 0.0005 | 0.001 | 0.001 | 0.005 | 0.25 | 0.004 | | 5374 |
| 0.001 | | 0.0005 | | | | | 0.001 | | 0.00003 | | 0.04 | 0.005 | | 52355 |
| 0.02 | | 0.002 | | 0.01 | 0.00001 | | 0.002 | | 0.000025 | 0.05 | 0.25 | 0.08 | | 52322 |
| | | 0.001 | | | | | | | 0.0002 | | 0.25 | 0.009 | | 52335 |
| | | 0.0005 | | | 0.00005 | 0.02 | 0.0005 | | 0.000015 | 0.001 | 0.3 | 0.04 | | 52300 |
| | | | | | | | | | | | | | | 51293 |
| | | 0.001 | 0.0003 | 0.0005 | 0.00005 | | 0.002 | 0.003 | 0.00006 | 0.0025 | 0.2 | 0.07 | | 52317 |
| 0.00005 | | 0.00007 | | | | | 0.0008 | | 0.00004 | 0.001 | 0.005 | 0.015 | | 5111 |
| | | 0.003 | 0.00005 | 0.0003 | | 0.04 | 0.0006 | | 0.000025 | 0.0013 | 0.075 | 0.015 | 0.03 | 5112 |
| | | | | | 0.00005 | | | | 0.00005 | 0.005 | 0.04 | 0.002 | | 52135 |
| | | 0.0005 | | 0.0005 | | | 0.0003 | 0.0003 | 0.00003 | 0.003 | 0.06 | 0.003 | 0.098 | 53170 |
| | | 0.003 | | | 0.00005 | | 0.002 | | 0.0001 | 0.05 | 0.0005 | 0.01 | | 53215 |
| | | | | | | | | | | | | | | 49281 |
| | | 0.001 | | | | | | | 0.0001 | 0.03 | 0.05 | 0.035 | | 53187 |
| 0.001 | | 0.001 | | 0.0005 | | | | | 0.00003 | 0.005 | 0.05 | 0.01 | | 53178 |
| | | 0.001 | | | | | 0.0001 | | 0.000025 | 0.005 | 0.05 | 0.02 | | 52271 |
| | | | | | | t | | | 0.00004 | 0.0013 | 0.006 | 0.06 | | 5190 |
| | | 0.0005 | | | | | | | 0.00002 | 0.003 | 0.055 | 0.002 | 0.086 | 518 |
| | | 0.0005 | | 0.0005 | | | | | 0.00005 | 0.0025 | 0.03 | 0.013 | | 53186 |
| t | 0.0005 | 0.00005 | | | 0.00004 | | 0.0001 | | 0.00004 | 0.002 | 0.08 | 0.006 | | 49223 |
| 0.001 | | 0.002 | | 0.002 | 0.00002 | 0.01 | | | 0.0001 | 0.0025 | 0.07 | 0.017 | 0.045 | 53175 |
| | | 0.0002 | | 0.0003 | | | | | 0.00003 | 0.0025 | 0.05 t | | 0.1 | 53198 |
| | | 0.0005 | | | | | 0.001 | | 0.000013 | 0.0025 | 0.05 | 0.007 | | 52369 |
| | | 0.001 | | | | | | | 0.00004 | 0.002 | 0.07 | 0.04 | | 52364 |
| 0.00005 | | 0.00007 | | | | | 0.0008 | | 0.00004 | 0.001 | 0.005 | 0.015 | | 52336 |
| 0.001 | 0.007 | 0.0001 | | | | | 0.002 | | 0.000015 | 0.0067 | 0.015 | 0.006 | | 5191 |
| | | | | | | | | | | | | | | 51292 |
| | | 0.0005 | 0.0005 | | | | | | 0.000025 | 0.01 | 0.035 | 0.015 | | 52289 |
| | | 0.001 | 0.0003 | | 0.00005 | | 0.0005 | | 0.001 | 0.002 | 0.05 | 0.003 | | 53193 |
| | | 0.0005 | | | | | 0.001 | 0.0005 | 0.0001 | 0.001 | 0.04 | 0.003 | | 49220 |
| | | 0.001 | | | | | 0.001 | 0.001 | 0.0005 | 0.002 | 0.2 | 0.001 | | 49221 |
| | | 0.0005 | | | 0.0001 | | 0.0005 | | 0.0001 | 0.002 | 0.02 | 0.002 | 0.078 | 53199 |
| | | 0.0015 | | 0.0005 | | 0.02 | | | 0.00004 | 0.005 | 0.015 | 0.02 | 0.056 | 52351 |
| | | 0.0005 | | 0.002 | | | | | 0.000025 | 0.025 | 0.2 | 0.01 | 0.048 | 52305 |
| | | 0.0002 | | | | | 0.0005 | | 0.000015 | 0.002 | 0.03 | 0.004 | | 52288 |
| | | | | 0.001 | | | | | 0.00001 | 0.003 | 0.03 | 0.004 | | 50350 |
| | | | | | | | | | | | | | | 49280 |
| 0.00005 | | 0.0005 | | 0.0005 | 0.0001 | 0.001 | 0.0005 t | | 0.0001 | 0.003 | 0.05 | 0.01 | | 53167 |
| | | 0.001 | | 0.0003 | 0.00005 | | | | 0.00002 | 0.01 | 0.1 | 0.002 | | 53188 |
| | | 0.005 | | 0.001 | | 0.02 | 0.002 | 0.005 | 0.0015 | 0.0005 | 0.007 | 0.01 | 0.0048 | 53191 |
| | | 0.0008 | | 0.0008 | 0.00005 | 0.02 | 0.0015 | 0.0007 | 0.00002 | 0.002 | 0.25 | 0.003 | | 52360 |
| | | 0.0005 | | 0.0003 | | 0.01 | | | 0.000025 | 0.005 | 0.01 | 0.01 | | 5113 |
| | 0.02 | 0.003 | 0.00002 | 0.0003 | 0.00005 | | 0.0004 | | 0.00002 | 0.0044 | 0.067 | 0.002 | | 49379 |
| 0.0003 | 0.0015 | 0.0003 | | 0.0002 | 0.00005 | 0.02 | 0.0005 | | 0.000025 | 0.0025 | 0.007 | 0.03 | | 5192 |
| | | 0.0008 | | | | | | | 0.0001 | 0.0025 | 0.2 | 0.001 | | 52348 |
| | | 0.0003 | | | | | | 0.005 | 0.000025 | 0.025 | 0.035 | 0.001 | | 52284 |
| | | | | | | | | | | | | | | 48162 |
| | | | | | | | | | | | | | | 49277 |
| | | | | | | | | | | | | | | 48164 |
| 0.002 | | 0.003 | | 0.0003 | 0.00005 | | 0.0025 | 0.0007 | 0.00007 | 0.0005 | 0.04 | 0.11 | | 52345 |

(a) Record of precise locality is on file in office of State Geological Survey of Kansas, Lawrence
(b) Net loss of weight on ignition from 105 degrees C to 1000 degrees C.
(c) Includes MnO, $ZrO_2$, $V_2O_5$, and Ti)2 when present.
(d) Total iron expressed as $Fe_2O_3$.
(e) Omitted in computing total, because included in L.O.I.

* In chemical analyses, blank indicates "not determined;" in spectrochemical analyses, blank indicates "not present in detectable amount," except that Sr was present but not determined in all samples tested.