**Article title**

Genesis and new mineral chemistry data of carlosbarbosaite, a new potential U and Nb ore source from miarolitic-, A-type granites and NYF pegmatites of the La Chinchilla pluton, Velasco ranges, La Rioja, Argentina

**Author names**

Raúl Lira • Francisco J. Parra • Marco E. Biglia • Orquídea Morello • Alina B. Guereschi

**Corresponding author**

Raúl Lira

Museo de Mineralogía y Geología “Dr. A. W. Stelzner”, Facultad de Ciencias Exactas, Físicas y Naturales, Universidad Nacional de Córdoba. Av. Vélez Sarsfield 299, (X5000JJC) Córdoba, Argentina

raul.lira@unc.edu.ar

Results of electron microprobe analyses of plagioclase (oxide data in wt. %) and calculated mineral formulae

and end member molar fractions from La Chinchilla granites and miarolitic pegmatites.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Sample | 5310-Ab 1 | 5310-Ab 2 | 5310-Ab 4 | 5309-Ab 1 core | 5309-Ab 2 rim | 5307AAb 1 | | 5307AAb 2 | 5307AAb 3 pert | 5307AAb 4 pert | 5307CAb 1 pert |
| SiO2 | 67.06 | 68.27 | 68.47 | 67.94 | 67.56 | 67.96 | | 68.04 | 68.38 | 68.41 | 67.81 |
| TiO2 | b.d. | b.d. | b.d. | b.d. | b.d. | b.d. | | b.d. | b.d. | b.d. | b.d. |
| Al2O3 | 20.23 | b.d. | 19.99 | 20.30 | 19.86 | 19.47 | | 19.89 | 19.77 | 20.20 | 19.87 |
| FeO | 0.02 | 0.03 | 0.07 | 0.02 | 0.08 | b.d. | | b.d. | b.d. | b.d. | 0.03 |
| MnO | 0.03 | b.d. | b.d. | 0.01 | b.d. | 0.02 | | 0.07 | 0.01 | 0.02 | b.d. |
| MgO | b.d. | b.d. | b.d. | b.d. | b.d. | b.d. | | b.d. | b.d. | b.d. | b.d. |
| CaO | 0.74 | 0.26 | 0.10 | 0.36 | 0.16 | 0.04 | | 0.01 | b.d. | b.d. | b.d. |
| Na2O | 11.43 | 12.00 | 12.04 | 11.81 | 11.97 | 11.96 | | 12.03 | 12.39 | 12.06 | 11.92 |
| K2O | 0.26 | 0.16 | 0.09 | 0.14 | 0.11 | 0.17 | | 0.17 | 0.07 | 0.05 | 0.18 |
| SrO | b.d. | 0.02 | b.d. | 0.01 | 0.03 | b.d. | | b.d. | b.d. | 0.06 | b.d. |
| PbO | 0.07 | b.d. | b.d. | 0.05 | b.d. | 0.01 | | 0.08 | 0.04 | b.d. | b.d. |
| BaO | 0.01 | b.d. | 0.05 | 0.08 | 0.04 | b.d. | | b.d. | 0.11 | 0.01 | b.d. |
| Cs2O | 0.01 | 0.03 | b.d. | 0.08 | 0.04 | 0.02 | | b.d. | b.d. | b.d. | 0.03 |
| P2O5 | b.d. | b.d. | 0.03 | 0.01 | 0.03 | 0.02 | | b.d. | 0.03 | b.d. | b.d. |
| Total | 99.85 | 100.77 | 100.84 | 100.80 | 99.89 | 99.66 | | 100.30 | 100.80 | 100.80 | 99.84 |
| Si | 2.948 | 2.969 | 2.973 | 2.957 | 2.966 | 2.985 | | 2.973 | 2.975 | 2.969 | 2.973 |
| Ti | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | | 0.000 | 0.000 | 0.000 | 0.000 |
| Al | 1.048 | 1.025 | 1.023 | 1.041 | 1.027 | 1.008 | | 1.024 | 1.014 | 1.033 | 1.027 |
| Fe | 0.001 | 0.001 | 0.003 | 0.001 | 0.003 | 0.000 | | 0.000 | 0.000 | 0.000 | 0.001 |
| Mn | 0.001 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | | 0.002 | 0.000 | 0.001 | 0.000 |
| Mg | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | | 0.000 | 0.000 | 0.000 | 0.000 |
| Ca | 0.035 | 0.012 | 0.004 | 0.017 | 0.008 | 0.002 | | 0.001 | 0.000 | 0.000 | 0.000 |
| Na | 0.974 | 1.012 | 1.014 | 0.996 | 1.019 | 1.019 | | 1.019 | 1.045 | 1.015 | 1.013 |
| K | 0.014 | 0.009 | 0.005 | 0.008 | 0.006 | 0.010 | | 0.010 | 0.004 | 0.003 | 0.010 |
| Sr | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.000 | | 0.000 | 0.000 | 0.002 | 0.000 |
| Pb | 0.001 | 0.000 | 0.000 | 0.001 | 0.000 | 0.000 | | 0.001 | 0.001 | 0.000 | 0.000 |
| Ba | 0.000 | 0.000 | 0.001 | 0.001 | 0.001 | 0.000 | | 0.000 | 0.002 | 0.000 | 0.000 |
| Cs | 0.000 | 0.001 | 0.000 | 0.002 | 0.001 | 0.000 | | 0.000 | 0.000 | 0.000 | 0.001 |
| P | 0.000 | 0.000 | 0.001 | 0.000 | 0.001 | 0.001 | | 0.000 | 0.001 | 0.000 | 0.000 |
| Total | 5.022 | 5.029 | 5.023 | 5.024 | 5.032 | 5.025 | | 5.030 | 5.041 | 5.023 | 5.025 |
| Ab % mol | 95.18 | 97.95 | 99.08 | 97.62 | 98.65 | | 98.89 | 99.00 | 99.62 | 99.74 | 99.02 |
| An % mol | 3.41 | 1.17 | 0.43 | 1.62 | 0.74 | | 0.16 | 0.06 | 0.00 | 0.00 | 0.00 |
| Or % mol | 1.41 | 0.88 | 0.49 | 0.76 | 0.61 | | 0.95 | 0.94 | 0.38 | 0.26 | 0.98 |

(continued)

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Sample | 4790  Pl 1 | 4790  Pl 2 | 4790  Pl 3 | 4790  Pl 4 | 4790  Pl 5 | 4790  Pl 6 | 4790  Pl 7 | 4790  Pl 8 | 4790  Pl 10 |
| SiO2 | 67.40 | 67.63 | 67.66 | 67.53 | 67.98 | 68.66 | 68.43 | 68.08 | 68.37 |
| TiO2 | b.d. | b.d. | 0.17 | b.d. | 0.07 | 0.17 | 0.05 | 0.02 | 0.20 |
| Al2O3 | 19.79 | 19.28 | 19.69 | 19.42 | 19.22 | 19.38 | 19.26 | 19.17 | 19.31 |
| FeO | b.d. | 0.01 | b.d. | 0.10 | 0.06 | 0.03 | b.d. | b.d. | 0.01 |
| MnO | b.d. | 0.10 | 0.05 | 0.07 | b.d. | 0.02 | 0.05 | b.d. | b.d. |
| MgO | b.d. | b.d. | 0.01 | b.d. | b.d. | b.d. | 0.01 | b.d. | b.d. |
| CaO | 0.39 | 0.19 | 0.03 | 0.18 | 0.05 | 0.12 | 0.06 | 0.17 | 0.13 |
| Na2O | 11.23 | 11.38 | 11.67 | 11.61 | 11.62 | 11.78 | 11.43 | 11.44 | 11.83 |
| K2O | 0.14 | 0.11 | 0.08 | 0.10 | 0.13 | 0.14 | 0.11 | 0.14 | 0.09 |
| SrO | b.d. | b.d. | b.d. | b.d. | b.d. | b.d. | b.d. | b.d. | b.d. |
| PbO | b.d. | b.d. | b.d. | b.d. | b.d. | b.d. | b.d. | b.d. | b.d. |
| BaO | b.d. | 0.14 | 0.24 | b.d. | b.d. | b.d. | 0.10 | 0.24 | b.d. |
| Cs2O | b.d. | b.d. | b.d. | b.d. | b.d. | b.d. | b.d. | b.d. | b.d. |
| P2O5 | b.d. | 0.02 | 0.02 | 0.02 | b.d. | 0.04 | 0.04 | b.d. | 0.01 |
| Total | 98.95 | 98.88 | 99.62 | 99.04 | 99.13 | 100.33 | 99.52 | 99.27 | 99.95 |
| Si | 2.976 | 2.992 | 2.975 | 2.983 | 2.996 | 2.992 | 3.002 | 3.000 | 2.991 |
| Ti | 0.000 | 0.000 | 0.006 | 0.000 | 0.002 | 0.006 | 0.002 | 0.001 | 0.006 |
| Al | 1.030 | 1.005 | 1.020 | 1.011 | 0.998 | 0.995 | 0.996 | 0.996 | 0.996 |
| Fe | 0.000 | 0.001 | 0.000 | 0.004 | 0.002 | 0.001 | 0.000 | 0.000 | 0.000 |
| Mn | 0.000 | 0.004 | 0.002 | 0.003 | 0.000 | 0.001 | 0.002 | 0.000 | 0.000 |
| Mg | 0.000 | 0.000 | 0.001 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Ca | 0.018 | 0.009 | 0.001 | 0.009 | 0.002 | 0.005 | 0.003 | 0.008 | 0.006 |
| Na | 0.961 | 0.976 | 0.995 | 0.994 | 0.993 | 0.995 | 0.972 | 0.977 | 1.003 |
| K | 0.008 | 0.006 | 0.004 | 0.006 | 0.007 | 0.008 | 0.006 | 0.008 | 0.005 |
| Sr | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Pb | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Ba | 0.000 | 0.003 | 0.004 | 0.000 | 0.000 | 0.000 | 0.002 | 0.004 | 0.000 |
| Cs | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| P | 0.000 | 0.001 | 0.001 | 0.001 | 0.000 | 0.002 | 0.001 | 0.000 | 0.000 |
| Total | 4.994 | 4.996 | 5.008 | 5.010 | 5.002 | 5.004 | 4.986 | 4.994 | 5.009 |
| Ab % mol | 97.34 | 98.45 | 99.43 | 98.58 | 99.06 | 98.70 | 99.10 | 98.37 | 98.91 |
| An % mol | 1.86 | 0.92 | 0.14 | 0.84 | 0.22 | 0.54 | 0.29 | 0.82 | 0.59 |
| Or % mol | 0.80 | 0.63 | 0.43 | 0.58 | 0.72 | 0.76 | 0.61 | 0.81 | 0.49 |

b.d.: below detection limit.

pert: perthite fraction.