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New observations on adakites from Cook Island, Austral Volcanic Zone, Chile

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Geochemical studies of adakitic rocks from the Austral Volcanic Zone (AVZ) of southern Chile have found an increase in crustal input from south to north. In particular, samples from Cook Island, the southernmost of recent Andean volcanoes, have previously been found to be distinctly uncontaminated in comparison to rocks from AVZ volcanoes to the north.

Newly acquired samples from eight lava domes on Cook, Kelvin, and Londonderry Islands show petrographic evidence of interaction with granitoid rocks of the Patagonian batholith. Most strikingly, abundant xenoliths of granitoid material in varying states of disaggregation and reaction with the host magma appear to be the rule rather than the exception.

The observed range of in the degree of interaction between xenoliths and host suggests that even in samples lacking in macroscopic xenoliths, the basement rocks may have had a geochemical influence on the adakitic magma. These observations therefore necessitate care when interpreting Cook Island adakites as primary slab melts.