

## Re: Quartz Origins (Uh–Oh, Another Geology Post)

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- *From:* Bruce Bathurst <[bruce.bathurst@xxxxxxxxxx](mailto:bruce.bathurst@xxxxxxxxxx)>
  - *Date:* Thu, 8 Jan 2009 11:23:51 –0800 (PST)
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On Jan 7, 11:37 am, Jo Schaper <[jo345sch765a...@xxxxxxxxxxxxx](mailto:jo345sch765a...@xxxxxxxxxxxxx)> wrote:

Bruce Bathurst wrote:

On Jan 6, 12:36 pm, Jo Schaper <[jo34schape...@xxxxxxxxxxxxxxxxxx](mailto:jo34schape...@xxxxxxxxxxxxxxxxxx)> wrote:

None of the dolomite in Missouri (unless it is actually pink crystals) is made properly, but I already know that, so I use other ways to determine what carbonate I'm dealing with. \*|:–)

Jo,

The oxalic acid crystals I used may occasionally have been citric acid crystals – whichever was available at the time. Truly, I never carried a plastic bottle of dilute hydrochloric acid on my belt, which always seemed excessive.

As I noted somewhere else in the thread, I just carry a old OTC nasal spray bottle with HCL clearly marked on it, I double bag it in ziplocks, and it's in the pack, not on my belt. Never had an issue with it, since that tiny squeeze spray hole is going to drip at best, even if the screw on cap came off.

However, this requires practicing with various known carbonate minerals before leaving for the field. You alluded once before to powdered dolomite not fizzing in an appropriate acid. This I've never encountered nor heard of; and it is important to geologists. I have no explanation, other than it's being a different carbonate. If it didn't fizz when powdered, how did you identify it as dolomite?

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Most of my field work is done in Paleozoic (Cambrian–Mississippian, occasionally Pennsylvanian) carbonates which are an insane mix of limestones, secondary dolostones, mudstones and thin crumbly shales. The sandstones are pretty discrete; but the other three sometimes interlayered and gradational. For the most part, the rock units around here are named as Potosi Dolomite, St. Louis Limestone, etc., so you would think knowing what unit it is in would be diagnostic, but because the dolostones are of the replacement variety, actual lithology varies quite widely. It is fairly easy to tell the limestones from the dolomites by texture; once you get the sparry limestones out of the mix, most of the limestones (grading into mudstone) are powdery, and rather soft; the dolostones are gritty, compact and generally harder. What confuses things even more are those incompletely dolomitized; it's not that unusual to have fossils retained in the dolomite— i.e. the rock will not fizz, it's not shaley or muddy, but is carbonate and has fossils in it. I've also picked out limestone exposures in putative dolomites— the book and the map says it should be dolomite, but it fizzes like crazy. What prompts me to test such rock? Its texture and eyeball muddiness.

I'm sure this method is non–scientific, and I don't expect it to work in an unfamiliar area, so I'm not advocating it. But that's what I like about geology— every time you put information in little boxes, some of it thumbs its nose at you and does the Nah–Nah–Nahnah! dance.

Yes, I don't think it's in keeping with recommended nomenclature to call a formation with various carbonates a 'Dolomite' or 'Limestone' unless they were named long ago. If it doesn't fizz when powdered, one must ask whether it is magnesian limestone (with Mg > 15%), dolomite, or mixtures including other carbonates. When the organic acidic granules I'm fond of indicated a different carbonate was present, the powder method graded nicely into simple wet–chemical tests to better identify the carbonates. Here's a long quote that might interest you. I've not read Logan, but you might find ideas for distinguishing various carbonate facies in his writings.

'When Sir William Logan was carrying on the survey of the Laurentian limestones of Canada, he received much help from what he called his "limestone spear." This was a sharp–pointed bit of iron fixed to the end of a pole or a walking–stick. He enlisted farmers and others in his operations, instructed them in the use of the spear, and obtained information which gave him a good general notion of the distribution of the limestone. The spear was thrust down through the soil until it struck the rock below. It was then pulled up, and the powder of stone adhering to the iron point was tested with acid. If, after trying a number of places all round, the observer uniformly obtained a brisk effervescence when the acid drop fell on the point of his spear, he inferred that the solid limestone existed below, and noted the fact on his map accordingly.'

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Geikie, A. 1882. *Outlines of Field Geology*, 3d ed. London: MacMillan, p. 27–8.

Bruce

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