The Alamo Breccia as a Conduit for Remagnetizing Fluids: Testing the Hypothesis

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The Late Devonian (Frasnian) Alamo Breccia Member of the Guilmette Formation (central Nevada) has been interpreted as a megasedimentary deposit formed by the ejecta curtain and tsunamis after a bolide impact event on or near a shallow marine carbonate platform. Preliminary paleomagnetic analysis of the breccia indicates that it has been remagnetized and does not contain a Devonian magnetization related to the impact. We are investigating the breccia to determine if it was a conduit for fluid flow events that could have caused the remagnetization. The breccia clasts contain two magnetic components, both of which fail conglomerate tests. An intermediate component with northerly declinations and steep down inclinations is removed below 325°C and is interpreted to reside in pyrrhotite. It is interpreted as a chemical or thermoviscous magnetization that was acquired in the Tertiary. The characteristic remanent magnetization (ChRM) with southeasterly declinations and shallow inclinations is found in the breccia clasts as well as the matrix. It is removed by 580°C and is interpreted to reside in magnetite. A tilt test indicates the ChRM is pre-tilting, and comparison with the Apparent Polar Wonder Path has suggests it is Late Paleozoic in age. It is interpreted as a chemical remanent magnetization (CRM). Unlike the Tertiary component, preliminary data from one locality suggests that this CRM is localized to the Alamo Member and is not present in normal marine carbonates directly above and below the breccia. This suggests that the breccia was a conduit for fluids which caused acquisition of the CRM. This hypothesis will be tested by additional paleomagnetic studies of the breccia and the rocks above and below from multiple localities. Petrographic/geochemical studies are underway to determine the origin of the fluids.