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Paleomagnetism of the Meramec and Osage formations in the Anadarko Basin

Jeffrey Hardwick, Kathryn Garrett, and Doug Elmore
University of Oklahoma , Geology and Geophysics , Norman, OK, 73019, United States (Jeffrey.hardwick-1@ou.edu)

Samples from an unoriented core in the Meramec and upper Osage formations (early to middle Mississippian) in the Anadarko Basin, Oklahoma, were examined in a paleomagnetic and diagenetic study. The Meramec is composed of siltstones and grainstones/packstones whereas the Osage is composed of grainstones. Both units are diagenetically altered to varying degrees. Preliminary paleomagnetic data from each of these units indicates a steep component removed at low temperatures (NRM-200°C) which is interpreted as a viscous remanent magnetization. Steep inclinations (> 80°) suggest it is contaminated by a drilling induced magnetization. A characteristic remanent magnetization (ChRM) with shallow inclinations is removed between 250°C and 450°C that is interpreted to reside in magnetite. At higher temperatures the magnetic intensity increases, probably because pyrite is being oxidized to magnetite. The ChRM is interpreted as a chemical remanent magnetization (CRM). The CRM resides in diagenetically altered siltstones and skeletal grainstones that cross the unconformity between the Meramec and underlying Osage formation. The shallow inclinations indicate it was acquired in the early Permian based on comparison with the expected inclinations for the study area. It is interpreted as a chemical remanent magnetization (CRM). The origin of the CRM is under investigation. Anisotropy of magnetic susceptibility (AMS) data indicates predominantly oblate sedimentary fabrics with sub – vertical K3 axes and streaked sub – horizontal K1 and K2 axes. Locally, some samples contain prolate fabrics which are associated with extensive diagenetic alteration.