

**The Epazoyucan-Sierra de Pachuca
Oligocene-Miocene silicic volcanism:
its relation to the Sierra Madre
Occidental and to the Trans-
Mexican Volcanic Belt magmatism,
geochemical and isotopic evidence**

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The Epazoyucan – Sierra de Pachuca (EP-SP), Hidalgo site, located on the eastern side of the Trans-Mexican Volcanic Belt (TMVB), is composed of a ~130 km² volcanic sequence. It initiates with a series of silicic rocks, continues with important andesitic to dacitic lava flows and domes, followed by silicic pyroclastic deposits, peralkaline rocks and several scoria cones. Emplacement of these magmatic events started during the Oligocene up to the Quaternary (~23 a 0.2 Ma) and its origin has been considered as subduction related.

Ages, geochemical, and isotopic characteristics of the basal silicic rocks from this assemblage were determined. K-Ar ages vary between 23.7 and 15.5 Ma for lavas and ignimbrite deposits with SiO₂ between 69 and 78 wt.%. They have calc-alkaline affinity with trace element patterns characteristic of subduction related processes. Their geologic attributes together with the Sr and Nd isotopic ratios and the trace element patterns suggest crystal fractionation with a slight amount of crust assimilation inside magmatic chambers related to a caldera. Pb isotopes also show a mixing line between mantle and crustal components. A genetic relationship has been tried to be established between these silicic rocks and the final (flare-up) ignimbritic events of the Sierra Madre Occidental (SMO). However, they could also be related to the first volcanic events of the TMVB. In any case, the late Oligocene-early Miocene silicic magmatism of the study area took place during a series of tectonic changes in west-central Mexico that marked the ending and the initiation of the generation of two of the most important magmatic provinces in Mexico. A volcanic emplacement orientation shift occurred, from NW-SE (SMO) to ~E-W (TMVB).