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# A new chemical etching technique for peridotites using molten anhydrous borax

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## ABSTRACT

A new chemical etching technique has been devised for synthetic Fe-free peridotites composed of forsterite (Fo), enstatite (En), and diopside (Di) Among the etchants were acids, molten carbonates, and borates, but it was found that only molten anhydrous borax ($Na_2B_4O_7$) dissolved all phases equally. Molten anhydrous borax was found to be a successful etchant in equally enhancing all the grain (i.e., Fo-Fo, En-En, and Di-Di) and interphase (i.e., Fo-En, Fo-Di, and En-Di) boundaries. From the back-scattered electron images of the etched surface, maps of grain- and interphase-boundaries can be obtained semi-automatically for microstructural analysis by using image processing software. An Fe-bearing wehrlite was also etched successfully by molten anhydrous borax, thus showing the usefulness of this technique for enhancing the grain- and interphase-boundaries in many natural peridotites.

**Keywords:** Etching, peridotite, anhydrous borax, grain boundary, interphase boundary