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# Electron microprobe and mineralogy evidence for the genesis of Scheelite and Tourmaline at the Nezamabad area, western Iran

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Nezamabad area is a part of Boroujerd granitoid complex located about 46 Km south-western Arak (Markazi province-Iran). This complex consists of mainly three units including qaurtzdiorite, granodiorite and monzogranite intruded on the Jurassic phyllites (Hamedan phyllite) and formed hornfels and spottedschist. This complex also has been cut by various pegmatitic and aplitic dykes and quartz-tourmaline veins. At the studying area, quartz-tourmaline veins with approximately 0.5 to 2 m thickness and general trend NW-SE exist as mineralized (including scheelite) and barren (without scheelite) veins. Scheelite with 0.22 % cut of grade accompanying by arsenopyrite, pyrite, pyrrhotite, chalcopyrite, malachite, azurite, sphalerite, covelite , goethite form the ore part of these veins. The most important gangue parts of the veins are quartz, tourmaline, calcite and dolomite respectively. In all veins, scheelite and tourmaline exist with each other concluding to their simultaneous generation. Mineralogical and electron microprobe analyses of the scheelite reveal that it is primary one (no replacement with wolframite), Ca-rich ( 19.4 % CaO) and Mo-poor which is consistent with its high fluorescence property. Mineral chemistry of tourmalines also shows that the tourmalines in those veins and quartzdioritic host rock are schorl and dravite one in terms of composition (with a general tendency toward dravite end member) and alkaline and calcic type respectively. According to the existence of Mo-poor scheelite at the studying area and evidences such as optical zoning occurring in tourmaline and it's tendency away from alkali- and proton-deficient tourmaline, it can be concluded that those scheelite bearing quartz-tourmaline veins are hydrothermal one and have been formed in an open chemical system. This conclusion can be strengthened by other evidences like widely varying composition of tourmaline, its fluorine amount similar to

hydrothermal veins and also their occurrence as vein form (quartz-tourmaline veins).