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Analysis of Persian turquoise color alteration based on absorption and Raman studies

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Turquoise CuAl6(PO4)4(OH)8.4H_2O is mined for more than 4000 years in Iran. Neyshabour Fyrouzeh Mine is one of the oldest one and known the occurrence one of the best gem-quality turquoise in the world. There is several turquoise mines in Iran and for this study we choose 3 major mines: Neishaboor (Khorasan province), Baghoo (Kerman province) and Chah Firoozeh (Damghan area) turquoise mines. Blue color in turquoise is due to Cu2+ but could be strongly modify by other substituted elements such as Fe2+, Zn2+ and specially Fe3+. In this study we analyzed this variation by optical absorption as well as by Raman methods and compared different color of turquoises from the blue (B) to the green (G) range of these three mines. The turquoises used in this study have low to excellent qualities.

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