THE VALENCE AND STRUCTURE STATE OF IRON ATOMS AFTER LASER AND THERMAL ANNEALING

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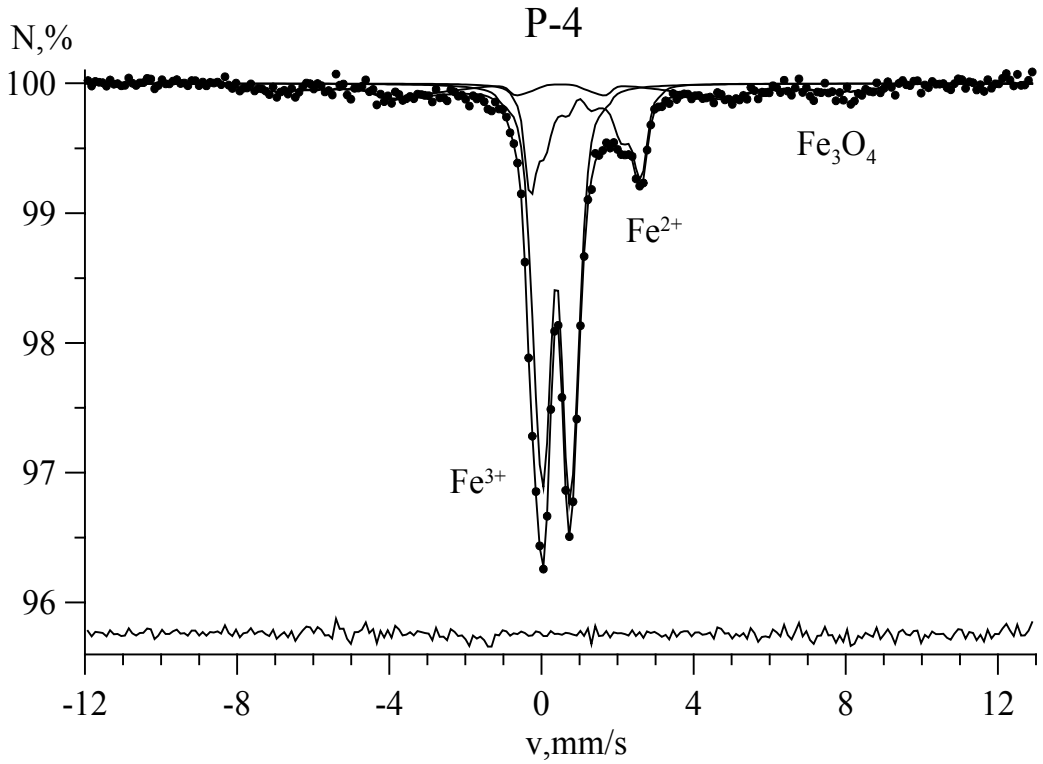
In this work the samples of natural palagonite (analogues with rock of Mars) and palagonite after laser and thermal annealing [1] were studded by ^{57}Fe Mössbauer spectroscopy. The results of fitting Mössbauer spectra are presented in Table. The isomer shift values Fe^{2+}, Fe^{3+} - ions indicates only octahedral coordination iron atoms.

Table. The weighted mean values of iron concentration (at. %) from date fitting by SPECTR and DISTRI programs [2].

Sample	Fe^{2+},%	Fe^{3+},%	Fe_3O_4,%	α-Fe,%
P-4	24.1±1.0	65.2±0.9	10.7±4.6	-
F-4	51.9±2.8	31.3±1.9	16.8±2.6	-
S-4	72.7±2.0	23.9±1.6	3.4±0.9	
L-2	89.6±3.0	4.0±1.5	-	6.4±2.4
L-4-2a	93.0±2.4	4.1±0.8	-	2.9±1.6



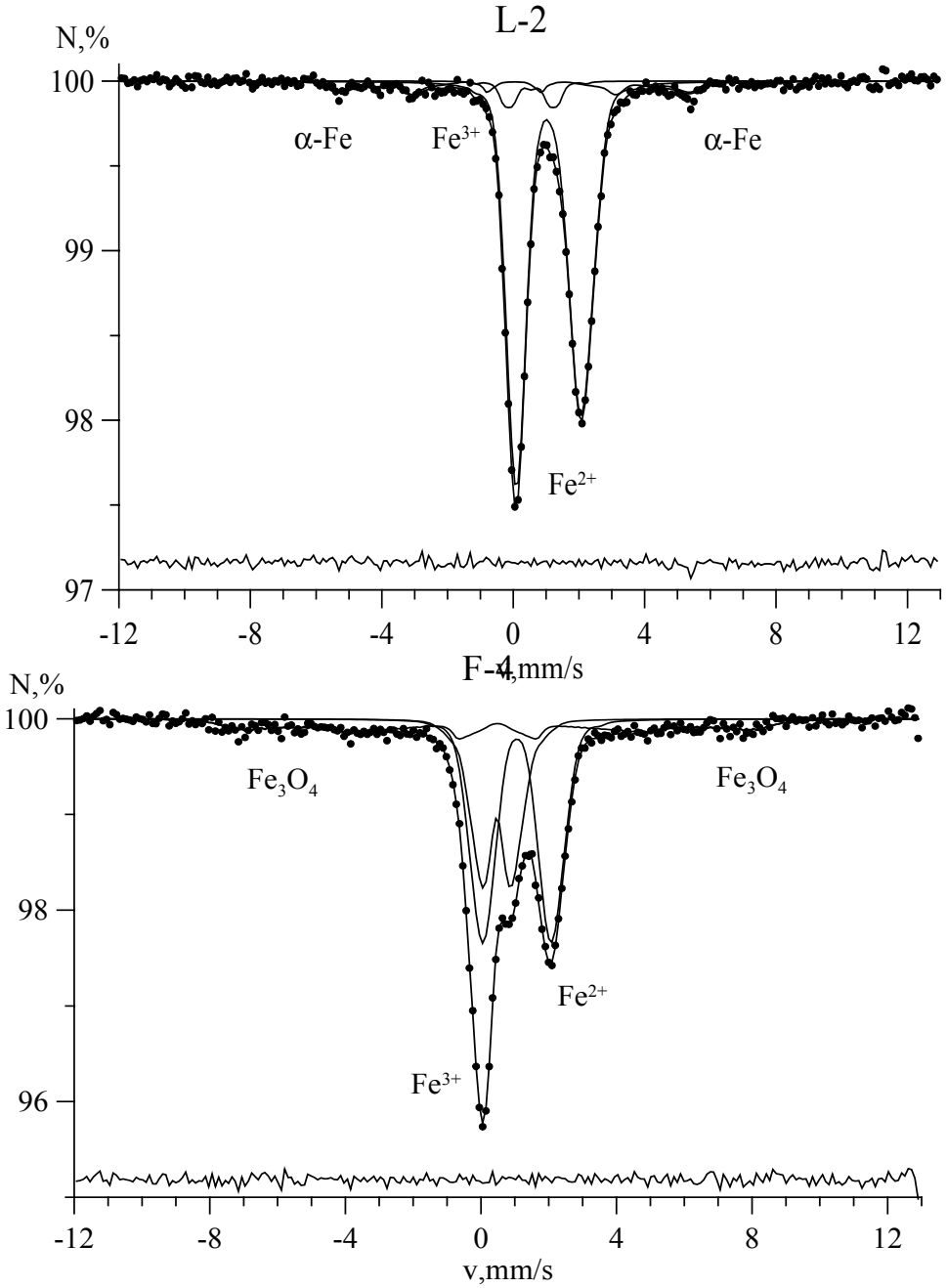


Figure. Mössbauer spectra of initial sample palagonite (P-4) and palagonite after laser (L-2) and thermal (F-4) annealing.

References

[1] *A.T.Basilevsky, O.I.Yakovlev, A.V.Fisenko, L.F.Semjonova, L.V.Moroz, C.M.Pieters, T.Hiroi, N.G.Zinovieva, H.U.Keller, A.S.Semenova, L.D.Barsukova, I.A.Roshchina, A.Kh.Galuzinskaya, I.A. Stroganov.* Simulation of effect of impact melting on optical properties of Martian soil. Experiments in Geoscience. 2000. V.9. №1. P.111-112.

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