Local Environment and Electronic Structure in K$_2$NiF$_4$-type La$_{2}$Li$_{0.50}$Cu$_{0.50}$O$_4$ Doped by $^{57}$Fe

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The $^{57}$Fe Mössbauer spectrum of the oxide La$_{2}$Li$_{0.50}$Cu$_{0.50}$O$_4$ doped with $^{57}$Fe (1 at.-%) underlines at 300 K the presence of three different components: two corresponding to the substitution of $^{57}$Fe probe atoms for respectively “Cu$^{3+}$” [Fe(1)] and Li$^{+}$ [Fe(3)] and the third [Fe(2)] attributed to $^{57}$Fe associated with oxygen vacancies. A decrease of the temperature down to 77 K does not lead to essential changes of the Mössbauer parameters corresponding to the Fe(1) and Fe(2) sub-spectra. On the contrary, a drastic change occurs in the Fe(3) sub-spectrum which has been interpreted by a displacement of the charge-transfer equilibrium Fe$^{4+}$\(3\) + O$^{2-}$ \(\rightarrow\) Fe$^{3+}$\(3\) + O(L) at the Li$^{+}$ sites.

**Key words:** Solid State, Electronic Structure, $^{57}$Fe Mössbauer Spectroscopy, K$_2$NiF$_4$-type Compound