Influence of laser power on nanocrystalline samples of ZnO(Co) prepared by commonly used wet chemistry method followed by calcination was investigated. Previous confirmation of the existence of ZnO and Co$_3$O$_4$ phases was based on the X-ray diffraction measurements. Here we report the experimental spectra of non-resonant Raman scattering in the range between 100 cm$^{-1}$ and 1600 cm$^{-1}$, for a series of samples irradiated with four different laser power densities. Increase in laser power density generally results in redshift and broadening of the peaks as well as formation of cobalt dimers. The four laser powers we used caused neither resonance nor thermal destruction. Relative intensity of the peaks does not depend monotonously on the laser power density and is different for ZnO, Co$_2$ and for Co$_3$O$_4$ peaks. The relative intensity of ZnO peaks and Co$_2$ peak increases while the one of Co$_3$O$_4$ peaks decreases with the increase in laser power density. Although intensity of Co$_3$O$_4$ peaks decreases, while intensity of formed Co$_2$ peak increase overall intensity of all cobalt modes increase with increase in laser power density. Laser-induced local heating of samples results in the larger red shift for both types of peaks compared to the red shift caused by doping. Three main mechanisms that can induce phonon peak shifts in ZnO nanostructures are spatial confinement, phonon localization by defects, and/or laser-induced heating in nanostructure ensembles. Note that only the last of the three can induce the resonant Raman peak redshift as large as tens of cm$^{-1}$. Our results indicate that the last two mechanisms induce redshift in the non-resonant Raman spectra. The most intense peak shift, larger than 10 cm$^{-1}$, occurs for laser induced heating whereas change in dopant concentration, which influences phonon localization, causes smaller redshift, i.e., smaller than 10 cm$^{-1}$. The later shift type corresponds to different value of dopant concentration.

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