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@Weinelt2014 showed that the low energy peak in the spectrum of the lithium-saturated sample is due to exciton pairs bound to surface silanol groups, whereas the higher energy peak results from free exciton pairs. @Karpinski1997 showed that the Li concentration leads to a shift of the exciton peak from 2.3eV to 2.4eV and that the proportion of excitons bound to surface groups decreases. @Weinelt2014 argues that the increase of the absorption observed for the 1M sample is due to a decrease of the exciton-pair absorption, and can be understood by considering the shift of the exciton peak with decreasing Li concentration. A decrease of the exciton-pair absorption explains the decrease of the red shift of the peaks with decreasing Li concentration. It is worth noting that the peak energy at 2.4eV and the broadening of the spectrum are

reproduced well for the Li-free sample by a model including only free excitons and surface effects. The model also predicts a red shift with decreasing Li concentration of the free exciton peak, which fits well with the experimental data. This indicates that the surface is the dominant source of the red shift of the free exciton peak. Moreover, for the Li-free sample the calculated value for the proportion of free to bound exciton pairs is ~ 0.6, whereas the experimentally observed value is ~ 0.2 [@Weinelt2014]. Since the model relies on a proportion of free to bound exciton pairs equal to the experimental value, this discrepancy could be related to the surface effects as discussed by @Karpinski1997, who points out the change in the concentration of surface silanol groups with varying Li concentration. In Figure \[fig:peaks_Li\] the spectra for the Li-saturated and Li-free samples are compared at temperatures of $0.3\,$K, $0.8\,$K, and $4\,$K. The peak energies at $0.3\,$K, $0.8\,$K, and $4\,$K are 2.61, 2.73, and 2.71eV for the Li-

saturated sample and 2.60, 2.72, and 2.65eV for the Li-free sample. The spectral widths of the peaks at the different temperatures are 0.07, 0.15,

F 2 TA ' 5 50 - s: - * E C .g: d â€¢ }Q9 - o'-o', Â£- : L ! q g c Yo-as-qu. free radicals in TL in high density polyethylene occurs due to molecular motion . and oxidation reactions along chains consisting of two parallel chains with a distance between them of the order of 2x10-10 A. As the chain length increases fffad4f19a