A method for determination of trace heavy metals (Cu, Fe, Ni and Zn) in water followed by flotation preconcentration is developed. The chelate Co(III) heptyldithiocarbamate, Co(HpDTC)$_3$, is used as a flotation collector. By continuously stirring of water system containing Co(II) ions, a solution of sodium heptyldithiocarbamate (NaHpDTC) is added. During the formation and growing of product particles, Co(II) is oxidised to Co(III), a green insoluble chelate precipitate of Co(HpDTC)$_3$ is formed. Simultaneously by the formation of this complex, traces of copper, iron, nickel and zinc present in the solution are incorporated in its structure. After addition of tenside, the precipitate is separated from water by air bubbles, dissolved by strong mineral acid and the solution then tested by flame atomic absorption spectrometry (FAAS) for Zn and Fe and electrothermal atomic absorption spectrometry (ETAAS) for Cu and Ni. To ascertain optimal mass of Co(II) and HpDTC$^-$, as well as pH and ionic strength of medium, preliminary tests were performed. The new flotation method is used for determination of metal traces in fresh water samples. The method permits the determination of 0.031 $\mu$g L$^{-1}$ Cu, 0.027 $\mu$g L$^{-1}$ Ni, 1.12 $\mu$g L$^{-1}$ Fe and 0.84 $\mu$g L$^{-1}$ Zn.