A general method of the ternary mixtures analysis has been presented. This method is based on the dependence between two different macroscopic physical magnitudes (the refractive index $n$, and the position of the long-wave absorption maximum $v_{\text{max}}$ of a solvatochromic dye) and the composition of the measured mixture. The presented method consists of: 1) determination of the relations: $v_{\text{exp}} = f(x_A, x_B, x_C)$ and $n_{\text{exp}} = f(x_A, x_B, x_C)$, which are the mathematical expressions of both calibration surfaces; 2) determination of the intersection traces of both calibration surfaces with the planes $v_{\text{exp}} = \text{const}$ and $n_{\text{exp}} = \text{const}$, where $v_{\text{exp}}$ and $n_{\text{exp}}$ are the values measured for the analysed ternary mixture; 3) determination of the intersection points coordinates of both traces mentioned above, which represent the searched fractions of the mixture components. The method was verified with a few ternary mixtures from which two are presented here: water–methanol–ethanol and water–ethanol–glucose (the latter component being in the form of a syrup). The calibration surfaces determined earlier gave the mixture component fractions with the absolute error less than 1% during ca 5 min necessary for the measurements and the mathematical calculations.