



## Interaction of Oilseed Pigments and Phospholipids in the Determination of Total Phenolic Compounds using the Folin-Ciocalteu Reagent

Mona El-Hamidi, Ferial A. Zaher and Safinaz M. El-Shami

Fats and Oils Department, National Research Centre, 33 Bohouth St. Dokki, Giza, Egypt

**Abstract:** A study was done to test the effect of minor components in vegetable oils on the accuracy of the method used for the determination of total phenolic compounds in vegetable oils using the Folin-Ciocalteu reagent (F-C). Main minor components in vegetable oils include chlorophyll, carotenoids and phospholipids and they were all considered in this study. Extracts of chlorophyll as well as carotenoids were prepared from rocket and carrot, respectively. Those extracts as well as a commercial sample of lecithin as being a common phospholipid in vegetable oils were added at different concentrations to a refined, bleached and deodorized sunflower oil (SFO). These oil blends were then subjected to spectrophotometric determination of total phenolic compounds using Folin-Ciocalteu reagent (F-C). The results of this study have shown that the effect of carotenoids and lecithin on the absorbance of the reaction product of phenolic compounds with Folin-Ciocalteu reagent at 765 nm used for the estimation of total phenolics in vegetable oils is negligible while the reverse was true in case of chlorophyll. As the chlorophyll concentration in the oil increases, the absorbance of the reaction product of phenolic compounds with Folin-Ciocalteu reagent at 765 nm increases and the estimated correlation coefficient,  $R^2$ , was found to be 0.95. This indicates that chlorophyll has a considerable reactivity towards the Folin-Ciocalteu reagent used giving higher estimates of phenolic content than the actual values. This suggests that this method is not a reliable one for the estimation of total phenolics in case of oils rich in chlorophyll if conventional procedure was followed. However, an equation has been derived using the results of this work that can be used for a more accurate estimation of phenolic compounds using Folin-Ciocalteu reagent by exclusion of the effect of chlorophyll interaction. By using this equation, the actual phenolic content in two olive oil samples used in this study would be 14 and 11% less than the estimated values following conventional procedure.

**Key words:** F-C Reagent, Carotenoids, Chlorophyll, Phospholipid, Total Phenolics.