

*Title:* **Total polyphenol content in agro-food industry wastes: Ferric antioxidant power (FRAP) assay versus HPLC.**

*Student:* Jordi Mendoza Bonet

*Date:* January 2019

*Supervisor/s:* Dr. Javier Saurina Purroy  
*Departament d'Enginyeria Química i Química Analítica*  
Dra. Mercè Granados Juan  
*Departament d'Enginyeria Química i Química Analítica*

This work has been done in order to develop the FRAP (Ferric Reducing Ability of Plasma) method in the optimal conditions for the analysis of the antioxidant power of fruit, vegetable, oil and wine wastes of the agro-food industry. This method is based on the reduction of  $\text{Fe}^{3+}$  salt to  $\text{Fe}^{2+}$  salt, having  $\text{Fe}^{3+}$  in large excess. TPTZ (2,4,6-Tris(2-pyridyl)-s-triazine) is used to complex the ferric ion because it makes a pale yellow colour solution for the  $\text{Fe}^{3+}$  form and when it is reduced to  $\text{Fe}^{2+}$  it has an intense blue colour, which is easy to measure with a spectrometer. Absorbance measured at 595 nm will be used as the analytical data to be correlated with the  $\text{Fe}^{2+}$  concentration. When it is known the concentration of  $\text{Fe}^{2+}$ , it can be assumed that this is an estimation of overall reducers (antioxidants) of our sample, due to they are the ones which reduce  $\text{Fe}^{3+}$ .

The other part of the work is the estimation of the antioxidant power of some samples with the method that have been developed. Then, it is wanted to compare the results with the polyphenols' content obtained by other determination methods, such as the Folin-Ciocalteu, or HPLC (High Performance Liquid Chromatography). This is done in order to check if the developed method has a response that correlates it with the other ones which are already developed.

It is also going to be evaluated the response of different kinds of polyphenols depending on the antioxidant power, which will depend on the functional groups and its position.