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**PHOTOCATALYTIC ISOMERIZATION OF CAFFEIC ACID AND ITS CYCLIZATION TO ESCULETIN**

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Caffeic acid (C<sub>9</sub>H<sub>8</sub>O<sub>4</sub>) is a natural compound belonging to the family of hydroxycinnamic acids. The photoisomerization of cinnamic acids may occur through a non-sensitized process by irradiation with light of suitable wavelength [1], but heterogeneous photocatalytic isomerization of cinnamic acids was never reported.

In this work we investigated the photoisomerization of trans-caffeic acid (T) to cis-caffeic acid (C) under UV light irradiation both in homogeneous phase and in the presence of various TiO<sub>2</sub> powders. Two commercial TiO<sub>2</sub> samples (Degussa P25 and Merck) and a home-prepared TiO<sub>2</sub> sample (HP0.5) were used as catalysts. Increasing pH resulted in higher C/T ratios. P25 and HP0.5 catalysts took part in the photoisomerization process, whereas the Merck sample revealed a weaker interaction with caffeic acid. A similar behaviour was previously found for the Merck sample in the presence of other hydroxycinnamic acids [2]. The isomerization of caffeic acid in the presence of P25 and HP0.5 occurs through two parallel pathways whose effects are synergistic: (i) the known non-sensitized isomerization in homogeneous phase and (ii) the photocatalytic TiO<sub>2</sub>-induced isomerization which is, to our best knowledge, hereby reported for the first time. The presence of oxygen in the reacting mixture under irradiation produced cyclization of the cis isomer to esculetin, a valuable coumarin derivative used for pharmaceutical applications.

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