

PALM TOCOLS (TOCOPHEROLS AND TOCOTRIENOLS) AS STANDARD REFERENCE MATERIALS (MRM 3)

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Tocols (collectively, better known as vitamin E), comprises tocopherols and tocotrienols, each of which has four isomers - α -, β -, γ - and δ -. Of the eight, five are found in palm oil. α -Tocopherol (α -T), α -tocotrienol (α -T₃), γ -tocopherol (γ -T), γ -tocotrienol (γ -T₃) and δ -tocotrienol (δ -T₃) (Goh *et al.*, 1985; Ng *et al.*, 2004a, b; Choo *et al.*, 2005). Together, they amount to 600-1000 ppm in crude palm oil (CPO) and 2000-4000 ppm in palm fibre oil (PFO) (Choo *et al.*, 1996; 2000; Ng *et al.*, 2004a, b), constituted as shown in Table 1.

TOCOL ISOMERS AS STANDARD REFERENCE MATERIALS

There is high demand for tocols (tocopherols and tocotrienols) as standard reference materials in scientific analyses as well as medical research. In addition, many other industries use them, such as cosmetics and nutraceuticals.

The high demand for tocols has boosted its price. While tocopherols are readily available from both natural and synthetic sources, the supply of tocotrienols is more limited.

Tocols can be obtained from palm oil as it is gifted with an abundance of these valuable compounds. Following extraction and purification, the end product is a range of high purity tocopherol and tocotrienol isomers. Quality control measures are taken to ensure the stability, reliability and homogeneity of the products.

PRODUCTION OF TOCOL ISOMERS FROM PALM OIL

All the five tocol isomers in palm oil can be extracted to more than 90% purity. The products have good homogeneity and reliability.

Stability studies over six months have shown that the purity of individual isomer can be maintained if stored in sealed vials at 4°C.



Figure 1. Malaysian oil palm fruit.

TABLE 1. COMPOSITION (%) OF TOCOL ISOMERS IN CPO AND PFO

Vitamin E	CPO (%)	Fibre oil (%)
α -Tocopherol	25.4	55.3
α -Tocotrienol	19.5	11.4
γ -Tocotrienol	1.7	3.5
γ -Tocotrienol	45.8	21.0
δ -Tocotrienol	7.6	8.8
Total (ppm)	600- 1 000	2 000 – 4 000

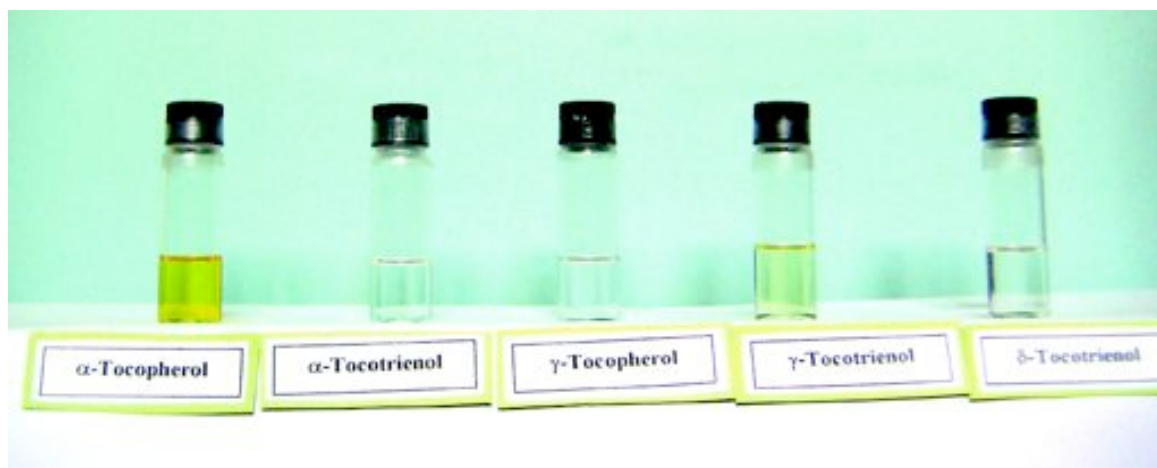


Figure 2. Tocol standard reference materials from palm.

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Figure 3. Tocol standard reference materials in analyses.

CONCLUSION

High purity tocol isomers produced from palm oil have purity of >90%. A dark and cold place is needed to store the products without deterioration.

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