Claims:

1. A process for modifying the composition of Vitamin E in tocotrienol-rich fraction (TRF) characterized by reducing or removing α-tocopherol content from TRF feed material and/or enhancing the content of β- and δ-tocotrienol in Vitamin E concentrate by the process of solvent extraction and fractionation of TRF feed material, wherein the process of solvent extraction and fractionation for reducing or removing α-tocopherol and enhancing the content of β- and δ-tocotrienol in vitamin E concentrate is by subjecting the TRF feed material to a process comprising the steps of:

a. Dissolving the tocotrienol-rich fraction (TRF) feed material in an alcohol;
b. Removing the alcohol-insoluble components from the tocotrienol-rich fraction (TRF1) solution;
c. Adding water to TRF1 solution to separate tocotrienol-rich fraction 2 (TRF2) from a saturated tocotrienol-rich fraction 3 (TRF3) solution;
d. Saturating the TRF3 solution in aqueous alcohol with a hydrocarbon solvent;
e. Extracting from the hydrocarbon-saturated aqueous alcohol TRF3 solution with addition of additional aliquot of hydrocarbon solvent to obtain tocotrienol-rich fraction 4 (TRF4) in hydrocarbon solvent and tocotrienol-rich fraction 5 (TRF5);
f. Separating TRF4 solution from TRF5 solution obtained in step (e);
g. Obtaining TRF4 by way of distillation of TRF4 solution obtained in step (f);
h. Partial removal of the aqueous alcohol from TRF5 solution obtained in step (f) above by further distillation to obtain saturated tocotrienol-rich fraction 6 (TRF6) and tocotrienol-rich fraction 7 (TRF7);
i. Adding hydrocarbon solvent to the saturated TRF6 solution obtained in step (h) above to obtain tocotrienol-rich fraction 8 (TRF8) and highly polar monoacylglycerol raffinate; and

j. Removal of solvent residue in TRF7 and TRF8 by distillation.

2. The process of claim 1 characterized by the tocotrienol-rich fraction (TRF) feed material used is derived from palm oil or palm fatty acid distillates or rice bran oil.

3. The process of claim 1 characterized by the tocotrienol-rich fraction containing α-tocopherol is derived from materials other than palm oil or palm fatty acid distillates or rice bran oil.

4. The process of claim 1 characterized by the alcohol used is methanol or ethanol or a mixture of methanol and ethanol or aqueous 1-propanol or 2-propanol.

5. The process of claim 1 characterized by the amount of water added has an alcohol to water ratio preferably of 10:1 v/v and more preferably 15:1 v/v.

6. The process of claim 1 characterized by the hydrocarbon solvent used is n-hexane, hexanes or n-heptane or a mixture of two or more of these hydrocarbon solvents.

7. The process of claim 1or 6 characterized by the hydrocarbon-saturated tocotrienol-rich fraction 3 (TRF3) is extracted with multiple aliquots of hydrocarbon solvent.

8. The process of any one of claims 1 – 3 characterized by the tocotrienol-rich fraction 2 (TRF2) can be recycled as a feed material (tocotrienol-rich fraction).

9. The process of any one of claims 1 – 3 characterized by the tocotrienol-rich fraction 4 (TRF4) or portions of tocotrienol-rich fraction 4 (TRF4) can be recycled as a feed material (tocotrienol-rich fraction).

10. The process of claim 1 characterized by the tocotrienol-rich fraction 4 (TRF4) is a tocotrienol product with an enriched total tocotrienol content and/or with a wide range of tocotrienol product composition and can be recycled as a starting feed material.

11. The process of claim 1 characterized by the TRF7 and/or TRF8 provides a wide range of tocotrienol products with an enriched total tocotrienol content, with reduced α-tocopherol content and/or enhanced β- and δ-tocotrienols content.

12. The process of claim1 or claim 11 characterized by the tocotrienol products have an α-tocopherol content preferably less than 7% of the total vitamin E content by weight, more preferably less than 5% of the total vitamin E content by weight and even more preferably less than 1% of the total vitamin E content by weight and most preferably less than 0.5% of the total vitamin E content by weight.

13. The process of claim 1 or claim 11 characterized by the tocotrienol products have a δ-tocotrienol content preferably exceeding 29% of the total vitamin E content by weight, more preferably exceeding 35% of the total vitamin E content by weight and most preferably exceeding 45% of the total vitamin E content by weight.

14. The process of claim 1 characterized by the removal of monoacylglycerols, triacylglycerols and diacylglycerols from the tocotrienol-rich fraction (TRF).

15. The process of claim 14 characterized by aqueous alcohol is used to remove the monoacylglycerols immediately after the removal of the alcohol-insoluble materials.

16. The process of claim 1 characterized by the process is carried out without the removal of alcohol-insoluble materials.

17. The process of claim 12 or claim 13 characterized by the tocotrienol products have clinical applications.

18. The process of claim 1 characterized by carrying out the process at room temperature and under atmospheric pressure.

19. The process of claim 14 characterized by the removal of monoacylglycerols, triacylglycerols and diacylglycerols from the TRF involved a two-step methanol extraction process.

20. The process of claim 1 characterized by using water to enhance the fractionation of α-tocopherol preferentially into the n-hexane phase and the β- and δ-tocotrienols into the methanol phase.

21. The process of claim 1 characterized by TRF7 and TRF8 or their combined fractions are the main tocotrienol product having low α-tocopherol content, high β- and δ-tocotrienol content and high total tocotrienol content.

22. The process of claim 1 characterized by the distillation of aqueous methanol and n-hexane is carried out by using a rotary evaporator or a falling film evaporator or a thin film evaporator or using any suitable distillation vessels under reduced pressure, preferably between 30,000–90,000 Pa.

23. The process of claim 1 characterized by removing the monoacylglycerols with aqueous methanol immediately after or without the removal of methanol-insoluble materials.

24. The process of claim 1 characterized by the TRF5 solution is distilled under partial vacuum until the clear solution turns milky to form the TRF6 solution emulsion as the top layer and with TRF7 as the bottom layer.