

# **Antioxidative properties and interconversion of tert-butylhydroquinone and tert-butylquinone in soybean oils**

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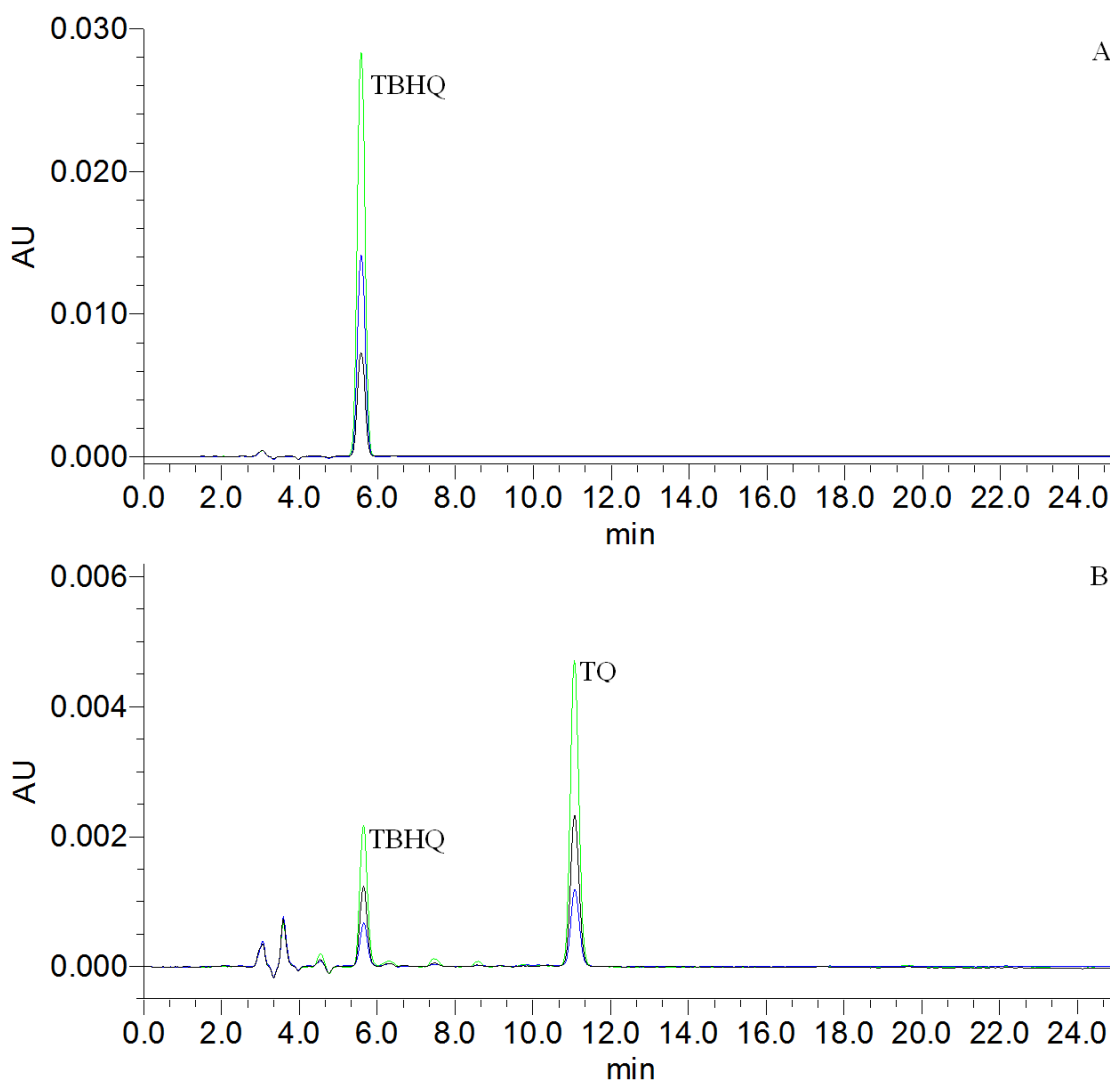
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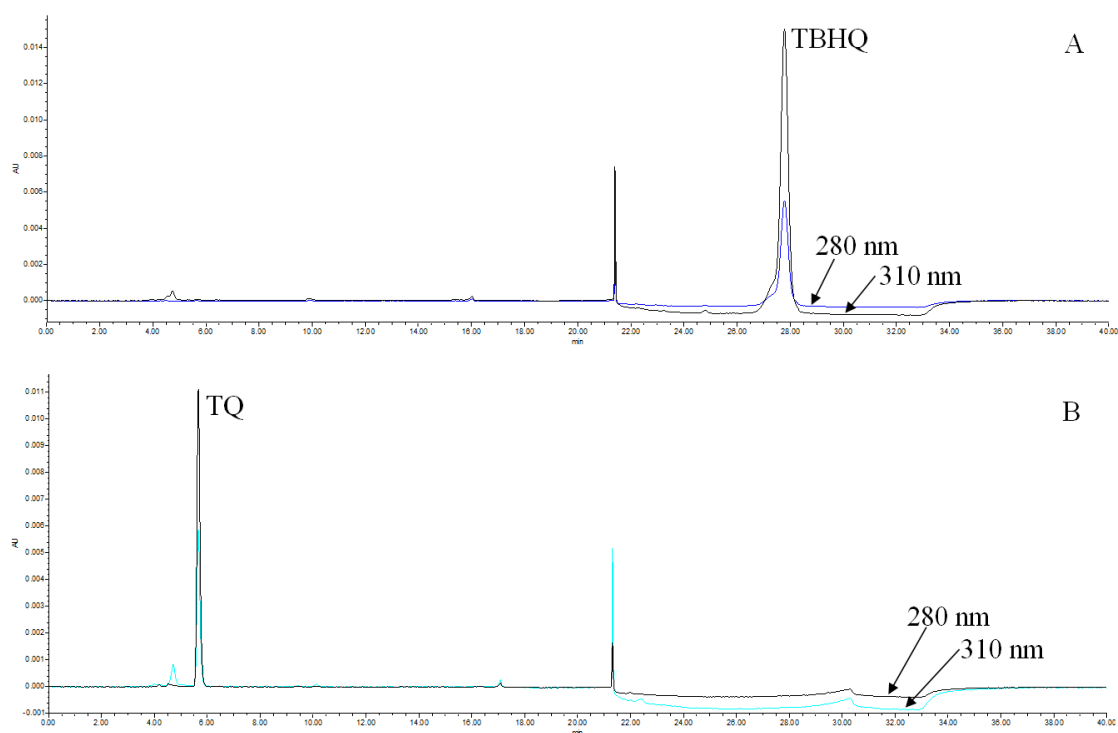
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**Supplementary Figure S1.** Superimposed RP-HPLC chromatograms of 5, 10, and 20  $\mu\text{g/mL}$  of TBHQ (profile A) and TQ (profile B) standard solutions. (Analysis conditions: the injection volume for TBHQ or TQ samples was 20  $\mu\text{L}$ ; the column was Symmetry C18 ( $4.6 \times 250$  mm, 5  $\mu\text{m}$ , Waters); the solvent system was methanol- $\text{H}_2\text{O}$  containing 0.5% AcOH (65:35, v/v); the flow rate was 0.8 mL/min; the detection wavelength was set at 280 nm; the column temperature was 35  $^\circ\text{C}$ . Methanol and  $\text{H}_2\text{O}$  containing 0.5% AcOH were both degassed for 15 min by an ultrasonic apparatus.)



**Supplementary Figure S2.** NP-HPLC chromatograms of TBHQ (profile A) and TQ (profile B) standard solutions. (the injection volume for TBHQ or TQ samples was 20  $\mu$ L; the column was Sunfire Prep Silica ( $4.6 \times 250$  mm, 5  $\mu$ m, Waters); the solvent system was *n*-hexane containing 5% ethyl acetate (solvent A) and *n*-hexane containing 5% isopropanol (solvent B); the gradient elution program was isocratic mode of 8% solvent B for 10 min, linear gradient from 8 to 100% solvent B for 5 min, and then isocratic mode of 100% solvent B for 12 min; the flow rate was 0.8 mL/min; the dual detection wavelengths were set at 280 nm for TBHQ and 310 nm for TQ, respectively; the column temperature was 30 °C. Solvents A and B were both degassed for 40 min by an ultrasonic apparatus.)

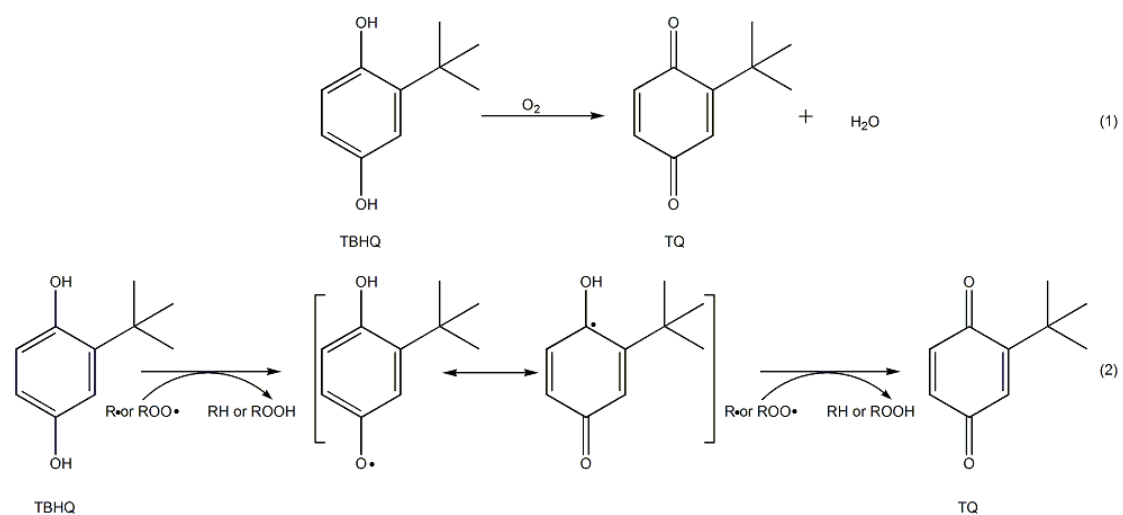


**Supplementary Figure S3.** Condensed volatiles from SBO containing TBHQ.

(Conditions: a total of 100.00 g of SBO with 20000 mg/kg of TBHQ was weighed into a 100-mL flat-bottom flask and then heated for 3 h at 180 °C under the reflux condensation mode.)



**Supplementary Figure S4.** Two pathways of TBHQ converting to TQ.



**Supplementary Figure S5.** Chemical structures of TBHQ and TQ.

