



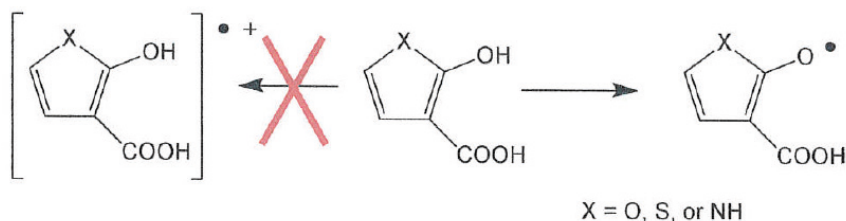
New Antioxidant Five Times more Effective than Vitamin E

BYU #2019-051

DESCRIPTION

Researchers at BYU have investigated five-membered heterocyclic compounds and have found them to be promising novel antioxidants.

From six structures that were evaluated in a computational process designed to predict antioxidant activity, four are predicted to be highly effective. One of the structures had the ability to exhibit antioxidant activity 5.6 times higher than Vitamin E.



The key reaction for the six compounds is illustrated in this figure. The predicted results indicate that the HAT pathway (shown at the right) is highly favored while the problematic SET path (shown at the left) is infeasible.

PROBLEM SOLVED

Most of the current available antioxidants react by two different pathways: single electron transfer (SET) and hydrogen atom transfer (HAT). The first pathway is undesirable because it is indiscriminate. For the antioxidants in the invention it has been demonstrated that HAT can be selected as preferred mechanism and SET largely eliminated if a strong intramolecular hydrogen bond is present. The experimental results support the conclusion that only one reaction path is available.

KEY ADVANTAGES

- » *Highly effective antioxidants*
- » *Improved reaction process*

APPLICATIONS

Antioxidants delay, prevent or remove oxidative damage to a target molecule. The invention could potentially be an effective solution in combating various diseases as a result of damage caused by free radicals such as neurodegenerative diseases and certain cancers. The antioxidant could also be used for non-pharmaceutical use such as preventing air oxidation of oils (e.g. crude oil).

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IP Status:
Patent Pending



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