Dear Mr. Mitchell,

On behalf of Afton Chemical Corporation, I would like to make the following comments on the draft proposal contained in the Concept Paper for Biodiesel and Renewable Diesel Rulemaking presented by the Air Resources Board (ARB) on January 20, 2010. My comments are specifically directed to the use of di-tertiarybutyl peroxide (DTBP) for mitigation of the exhaust NO_x increase generally observed from biodiesel blended fuels.

Numerous studies have shown that both DTBP and 2-ethylhexyl nitrate (EHN), when added to diesel fuel, will reduce NO_x emissions. In 2003, the United States Environmental Protection Agency analyzed the results of these studies and proposed an equation that quantified the amount of NO_x reduction expected for a given increase in cetane number due to additives (1). This equation did not specify the identity of the cetane improver used. Therefore, to the extent that they improve a fuel's cetane number, EHN and DTBP were considered equivalent for NO_x reduction.

Other papers have reported on the effects of cetane number improver additives in biodiesel blends. The National Renewable Energy Laboratory (NREL) studied a number of potential approaches to mitigate the NO_x increase observed when using biodiesel blends. They concluded that "The cetane improvers DTBP and EHN are effective for reducing NO_x by 4% in B20 blends. DTBP at 1 volume percent will add on the order of $0.16 per gallon and EHN at 0.5 volume percent will add on the order of $0.05 per gallon to the cost of biodiesel"(2). A very recent study conducted by West Virginia University evaluated the change in NO_x emissions from a variety of engines when either EHN or DTBP was added to the fuel (3). Within test error, both additives were found to reduce NO_x emissions by the same amount in 100% diesel fuel and a B20 blend.

The data upon which the proposed rule allowing 2500 ppm DTBP (but not EHN) to be used in B5 or less blends is incomplete. It appears that EHN was tested only once in a single engine at a treat rate (10,000 ppm) higher than any we have ever encountered in the field. It cannot be concluded that an additive will be ineffective at a normal treat rate because it did not work in a single test at an unrealistically high treat rate. In our opinion, the tests conducted for CARB do not provide enough information to fairly evaluate, much less eliminate the use of EHN, the most cost effective cetane improver additive, from use for NO_x mitigation in B5 blends.

In summary, there exists a large amount of public information available on the effects of additives on NOx emissions. The published data overwhelmingly indicates that EHN and DTBP additives are essentially equivalent for NO_x emissions reductions from both 100% diesel and biodiesel blends up to B20. The data that ARB relied on for the proposal to allow only DTBP use in B5 is sparse and does not include an evaluation of EHN at reasonable treat rates or in multiple engine models.

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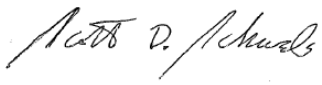
We urge ARB to consider the following :

1. Review and use the available literature to help guide rulemaking.
2. Run B5 emissions tests that include EHN at reasonable treat rates (1000-3000 ppm) and in other engine models.

If you have any questions, please call me at 804-788-6395.

Thank you,



Scott D. Schwab
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Afton Chemical Corporation
February 4, 2010

References

1. The Effect of Cetane Number Increase Due to Additives on NO_x Emissions from Heavy-Duty Highway Engines, EPA420-R-03-002, February 2003.

2. McCormick, R.L., Alvarez, J.R. and Graboski, M.S., NO_x Solutions for Biodiesel, NREL/SR-510-31465, February 2003.

3. Nuszkowski, J., Tincher, R.R., Thompson, G.J., Evaluation of NO_x emissions from heavy-duty diesel engines with the addition of cetane improvers, Proc. IMechE, Vol 223 No. 8 Part D: J Automobile Engineering, 1049-1060, 2009.