

Researchers find treating pavement with titanium oxide reduces air pollution

11 July 2013, by Bob Yirka

(Phys.org) —Researchers at Eindhoven University of Technology in The Netherlands have found that treating pavement with titanium oxide causes a reduction in nitrogen oxide air pollution. In their paper published in the *Journal of Hazardous Materials*, the team describes how they treated pavement sections in the city of Hengelo with titanium oxide and then took air samples that showed lowered levels of nitrogen oxide.

Nitrogen oxide is a poisonous gas—it's released into the air by both gasoline powered vehicles and coal burning power plants—when it reacts with other chemicals in the air, smog results. Because of the [negative health effects](#) on people living in cities, researchers have been looking for novel ways to reduce the amount of pollution in the air. In this new effort, the team turned to titanium oxide (a naturally occurring oxide of titanium), a material that has been previously known to absorb nitrogen oxide. They mixed the material with normal concrete to create photocatalytic blocks which were then placed into a 150 meter section of road bed. They also placed identical blocks—save for the [titanium oxide](#)—in another 100 meter section of roadbed nearby to serve as a control.

Once all the blocks were in place the researchers began to take periodic [air samples](#) from above both the treated and untreated blocks—on 26 days over a period of a year. They also took note of other variables such as the amount of traffic that drove over the blocks, temperature, [humidity levels](#), wind speed and direction and both visible and UV light.

In analyzing the data from their samples they found that nitrogen oxide levels were on average 19 percent lower (for full day samples) over the treated blocks than over the control blocks. They also found that when weather conditions were ideal, the air over the treated blocks had 45 percent less of the pollutant than air over the control blocks, showing just how effective the

treatment can be.

The researchers note that treating the blocks causes them to be more expensive than those normally used and that their ability to pull nitrogen oxide from the air degrades with time but suggest that such treatment could prove valuable in areas of heavily concentrated smog.

More information: [Road surface purifies air by removing nitrogen oxides](#)

© 2013 Phys.org

APA citation: Researchers find treating pavement with titanium oxide reduces air pollution (2013, July 11) retrieved 20 September 2019 from <https://phys.org/news/2013-07-pavement-titanium-oxide-air-pollution.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.