



REVIEW AND UPDATE OF TECHNOLOGY FOR 2019

A year of significant breakthroughs

Burnaby, British Columbia / January 16, 2020 – Aether Catalyst Solutions, Inc. (“ATHR” or the “Company”) (CSE: ATHR), is pleased to provide the following detailed review of the Company’s 2019 progress towards development and commercialization of its catalysts.

HIGHLIGHTS

- ***Over 10X improvement in aging robustness under wet air aging conditions***
- ***Improved lab infrastructure and procedures to yield significantly high throughput of evaluating catalyst formulations***
- ***Developed ability to simulate aging and test protocols used by OEMs***

Aether is developing catalytic materials for industrial use. The Companies first products are catalysts for use in automotive emissions abatement. Aether’s catalysts are free of expensive precious metals (Platinum, Palladium, and Rhodium). It is estimated that over \$20 billion of precious metals (at today’s prices) were utilized in the automotive industry for emissions abatement in 2018. Aether’s catalysts are initially to be utilized in gasoline powered Engines, making up two-thirds of this market. The cost savings, accruing to the industry, are estimated at approximately 80% - strong enough to generate significant pull for the technology; indeed, Aether has had great success engaging OEMs.

Going into 2019, Aether had an exciting and promising catalyst with very good un-aged performance. However, it was not yet able to perform adequately when subjected to industry standard aging stressors.

2019 was a transitional year for the company in several important ways that addressed some of its most pressing technical limitations and positioned Aether closer to commercialization.

Detailed highlights, in chronological order include:

First Quarter – *New lab & increased evaluation capability*

- We completed the build out of our new lab, resulting in a facility with much improved flow of sample making, aging and evaluation, leading to a significantly improved through-put of new catalyst formulations, increasing our understanding of catalyst failure mechanisms.
- Through a thorough investigation into all aspects of our development process, we were able to significantly reduce sample to sample variability – crucial in any development process.
- Increased testing capability through additional test equipment which further increased through-put and data generation for understanding the possible Hydrocarbon (HC) degradation mechanisms.

Second Quarter – *more rapid screening and first advance*

- Developed a rapid screening process that allowed for over 50 catalyst variants to be evaluated, dramatically increasing data generation.

- In the first of several advances this year, discovered a process change that resulted in a further reduction in sample to sample variability and improved HC conversion from 40% to 55% after 16 hours at 900C with wet air aging.
- Used advanced measurement/characterization tools such as X-ray Photoelectron Spectroscopy (XPS), X-ray Diffraction (XRD), and internally generated test data, Aether significantly improved its understanding of the material changes its catalysts undergo during wet air aging.
- Converted provisional patent application to formal PCT application.

Third Quarter – *technological leap, reliable model, and further IP*

- As part of an ongoing development process, Aether identified two independent variables whose manipulation led to a **massive improvement** in HC conversion aging robustness – our biggest leap yet. This formulation of the catalyst took HC conversion from 55% after 16 hours of wet aging to 50% after 100 hours of wet aging, introducing the last major stressor to the catalyst (the stressors are 900C temperature for 100 hours in the presence of H₂O).
- Aether developed a de-greening process that facilitated a reduction in the temperature at which NOX conversion occurs.
- Aether built an HC degradation model that explained most of the aging mechanism; this has been helpful in assisting developmental activities – while not yet definitively proven, the model has become a very useful tool.
- Aether submitted a provisional patent on its latest catalytic material.

Fourth Quarter – *further advances and enhanced testing capabilities*

- **In another very significant leap**, based upon advances made in the prior quarter, Aether was able to take the performance of its lead catalyst formulation to HC conversion of 88% at 465C after 100 hours of wet aging at 900C (with both NOX and CO at higher levels).
- During the quarter, Aether spent considerable time and resources to develop aging and testing capabilities more in line with those utilized by the OEMs. To that end, Aether developed a Lambda Sweep Test, which is the industry standard test to evaluate the sensitivity of the air-to-fuel ratio on conversion rates. Additionally, in consultation with one of the OEMs that Aether is in ongoing discussions with, Aether developed a hydrothermal rich/lean cycle aging test. Both tests represented advancements for Aether, as they allow data to be presented in formats familiar to the OEMs.
- The most recent catalyst formulation was put through the hydrothermal rich/lean cycle aging test for 100 hours at a temperature of 900 C. The conversion rates of HC, CO and NOX were measured during the Lambda Sweep Test. Conversion results were high for all three exhaust gases and will form a good data package for discussion with OEMs and OEM suppliers in 2020.

Overall, Aether’s team of engineers and scientists saw an acceleration of development over the year as discovery built upon discovery, leading into what is hoped to be a year where the Company can begin to take advantage of business development opportunities that have presented themselves over the last 18 months.

At the start of the year, Aether developed six technical goals to meet by year end. It is important to note that these technical goals were specifically made to be challenging to ensure that if they were met,

the Company would be offering a compelling incentive to further engage the OEMs that we have tested with. Over the full year, Aether met five of its six technical goals. The one goal missed was performing the industry standard 4-Mode aging test as described by the California Air Resource Board (the Rapid Aging Test or R.A.T.). This goal was missed primarily due to the complexity and cost of test equipment needed to perform the test which was deemed a lower priority than improving the HC aging robustness. (However, the [OEM suggested] hydrothermal rich/lean cycle test is viewed as good surrogate for this test)

The 2019's significant technological developments have put Aether in a solid position to start more aggressively engaging the OEMS, and their suppliers, for evaluation of the technology, and ultimately, a closer working relationship.

Aether will announce 2020's goals in a subsequent news release.

ABOUT THE COMPANY:

Aether Catalyst Solutions, Inc. is focused on providing an order of magnitude cost reduction in automotive catalytic converter catalyst, while meeting, or exceeding government emission standards. Aether is working to quickly advance its technology through rapid screening of new materials directed at enhancing end of life conversion levels after accelerated aging. While Aether's primary focus is automotive, other potential applications for this low-cost technology are also being explored.

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