

UV vs. Corona Discharge Ozone Generation

Summary

In this experiment we compared the performance of a powerful UV/Ozone system (the Surfinator™, shown in previous studies to be over two times as effective as competing and significantly more costly instruments using UV light for ozone production) to the new Mo'zonator™ Mini corona discharge (CD) ozone generator. The Mo'zonator™ series of ozone generators are so powerful that we created this Mini version that is far smaller and cheaper than even our economical Surfinator™ not to mention the underperforming, obsolete, and overpriced competitor's instrument.

Methods and Results

Three microliters (3μl) of a freshly prepared (within 24 hours) 1M KI (potassium iodide) solution was pipetted in duplicate onto Whatman filter paper (https://en.wikipedia.org/wiki/Whatman_plc) and allowed to dry for one minute under ambient conditions. The KI-paper was immediately exposed for ten seconds (10s) to ozone produced by either a Surfinator™ or a Mo'zonator™ Mini. Upon exposure to ozone the KI turns a brown orange color that is indicative of the amount of ozone exposure and can be used for relative comparison of ozone generator systems.

This spots were photographed in the same field (i.e., a single photograph) and then analyzed using ImageJ, a ubiquitous public domain analytical software platform (<https://en.wikipedia.org/wiki/ImageJ>). The image below shows the results of this analysis. Panel A shows the raw data, a color photograph acquired with a cell phone camera (Samsung Galaxy, Android OS). The image was converted to gray scale in ImageJ and then analyzed using the densitometer analysis program developed for electrophoretic gels. The gray scale image showing the virtually scanned areas and the resultant density scans are presented in Panel B of the figure.

Conclusions

This study shows that the Mo'zonator™ corona discharge (CD) approach is vastly superior to UV-based systems for creating ozone. Further, the CD method is safer (no mercury, no harmful radiation) and far less expensive than UV systems. Finally, in keeping with the mission of Creodyne to produce better products for less money and distribute them as widely as possible, the full plans for the Mo'zonator Mini and additional Mo'zonator designs will be posted so DIY enthusiasts can build and modify them to taste. We will, of course, be happy to build one for you and sell it at a reasonable cost (guaranteed to be far less than you would pay for a "scientific" ozone production system).

The Mo'zonator™ Series Ozone Generators: Mo'zonator™ Mini vs. Surfinator™

Figures



Figure 1. KI development resulting from treatment for 10s with ozone produced by a leading UV system vs. the corona discharge system employed by the Mo'zonator™ instrument series. Panel A shows a comparison of raw data (more color equates to more ozone flux). Panel B shows a gray scale image of panel A and the resultant density scan, clear illustrating that production of ozone by the Mo'zonator™ greatly exceeds that of a leading UV system (the Surfinator™). It is noteworthy comparable that the Surfinator™ has been shown to out perform more expensive commercial UV systems 2-3 fold. Thus, the Mo'zonator™ system is far less costly (you can build your own using a 3D printer) and far more powerful.

