



The Power of DBI Technology



The dielectric barrier ionizer (DBI) cell may look cute and simple, but it holds a key which unlocks seriously powerful air purification technologies.

The DBI cell mimics a bolt of lightning in a thunderstorm. As lightning strikes, it creates several different molecules, especially OH (the hydroxyl radical), which is an outstanding oxidizer. OH molecules clean the air of our world. Could we bring that same natural cleaning

technology inside our homes?

By producing OH radicals, the DBI cell

- **Sterilizes** (decreases germs, viruses, and bacteria in the air and on surfaces)
- **Deodorizes** (decreases bad odors produced by smoke, ammonia, trimethylamine, H₂S, toluene)
- **Removes harmful materials** (such as VOCs, formaldehyde, toluene, etc., which cause sick house syndrome)
- **Keeps food fresh** (decreases fungus and mold spores and decomposes ethylene from fruits and vegetables)

The DBI cell generates ion clusters with “high binding energy.” An ion cluster comprises 10 to 60 oxygen ion molecules with lots of + ions and – ions, including OH radicals. These ion clusters envelop and oxidize bad odor molecules, germs, viruses, bacteria, and many other pollutants. The DBI cell creates natural purification, mimicking what is found in nature.

UNIVERSITY PARK, Pa. — Lightning bolts break apart nitrogen and oxygen molecules in the atmosphere and create reactive chemicals that affect greenhouse gases. Now, a team of atmospheric chemists and lightning scientists have found that lightning bolts and, surprisingly, subvisible discharges that cannot be seen by cameras or the naked eye produce extreme amounts of the hydroxyl radical — OH — and hydroperoxyl radical — HO₂.

The hydroxyl radical is important in the atmosphere because it initiates chemical reactions and breaks down molecules like the greenhouse gas methane. OH is the main driver of many compositional changes in the atmosphere.

<https://www.psu.edu/news/research/story/lightning-and-subvisible-discharges-produce-molecules-clean-atmosphere>; by A'ndrea Elyse Messer. April 29, 2021. Accessed 4/21/2026.

Why does DBI cell ionization work better than other ionization technologies?

Most chemical substances have binding energy over 6 eV¹, so a higher energy level is required to remove them. For example:

Chemical Materials	Family	Formula	CAS #	IE.eV
Ammonia	Inorganic	NH ₃	7664-41-7	10.07
Benzene	Aromatic	C ₆ H ₆	71-43-2	9.24
Ethylene	Alkene	C ₂ H ₄	74-85-1	10.51
Formaldehyde	Aldehyde	CH ₂ O	50-00-0	10.88
Hydrogen Sulfide	Sulfide	H ₂ S	7783-06-4	10.46
Toluene	Aromatic	C ₇ H ₈	108-88-3	8.83

DBI cells produce ion clusters with high binding energy (more than 6eV), which works to decrease odors and chemicals that needle-point and brush type ionizers cannot decrease.

Test Report Data: Removal Efficiency of DBI Cell Technology

	Contaminants	Efficiency	Test Institute
Bacteria & Virus	Covid-19 Virus (SARS-Cov-2)	98.5%	KR Biotech
	Influenza A Virus (H1N1)	95%	Kitasato (Japan)
	S. Aureus Bacteria	99%	KTR, SCLAB
	Salmonella	99%	KCL
	E. coli Bacteria	99%	KTR, SCLAB
	Bacteria	99%	Enviro Screening Lab (USA)
	Fungi	99%	Intertek (France)
Chemical & VOCs	VOC	98%	Samsung Electronics
	Formaldehyde	98%	KCL
	Ammonia	93%	Inha University, KTR
	Toluene	92%	Inha University, KTR
	H ₂ S	98%	KTR
	Acetone	98%	KCL
	Ethylene	100%	KCL

¹ Binding energy of 6 eV means that it requires 6 electron volts of energy to remove a particle from a system or to disassemble that system into its individual components.