

## TECHNICAL BULLETIN

### UV Exposure and BromMax

In 2003, Enviro Tech was the first company to isolate and quantify the active ingredient, not only in BromMax, but the active ingredient common to all liquid stabilized bromine (LSB) products. Although Enviro Tech discovered a 3<sup>rd</sup> process *method* to manufacture liquid stabilized bromine, all 3 liquid bromine products on the market today yield the *same* active ingredient. Heretofore the industry referred to these products as stabilized sodium hypobromite, and some of these erroneous descriptions continue today. Since all commercial LSB products are liquid, the structure of the LSB molecule remained a mystery because the true active molecule could not be isolated. However, in the laboratory Enviro Tech's chemists purposely created a super-saturated BromMax solution and a solid rhombohedral-shaped crystal developed. Subsequent x-ray diffraction analysis identified that a new compound had been discovered: N-bromo-sulfamate. We now know that this compound is the end result of ANY process that yields LSB. It matters not if the starting materials are sodium bromide and sodium hypochlorite, or bromine chloride. Although the pathways may be different, the resultant molecule is the same.

We have further discovered that this molecule is very sensitive to UV (ultra violet light) exposure. In it's diluted state, such as in the low ppm ranges in cooling water, LSB has UV sensitivity similar to sodium hypochlorite. However, in its neat (concentrated) form it is orders of magnitude more sensitive to UV exposure than its diluted counterpart. Likewise, as the concentration of the formula increases above 3-5% activity (as Cl<sub>2</sub>), the LSB products become increasingly more sensitive to UV exposure, which ultimately decomposes the active ingredient. It therefore becomes an obvious economics issue for all LSB products. The *rate* of decay due to UV exposure is relative to the concentration of the LSB, due to the basic (chemistry) laws of concentration kinetics.

With this basic premise being established, we recognize that BromMax (10.2 as Cl<sub>2</sub>) is very sensitive to UV exposure, and more so than the other competitive products. There is no question that as an LSB product increases in neat concentration, its rate of decay from UV exposure increases significantly. For this reason we recommend that all LSB products be protected from UV sunlight. This is especially important for BromMax 10.2, as it is 34% and 42% more concentrated than either Stabrom or Stabrex, respectively. The UV sensitivity of neat BromMax is significantly greater than either of the 2 other competitive materials, and therefore more precautions must be observed to benefit from the economic advantages of BromMax. Although all LSB products are susceptible to the UV decay phenomenon, we strongly recommend that you *preserve* your investment in LSB and consider:

- 1) In all cases cover or remove drums or tanks from direct sunlight.
- 2) Move them to shady areas if possible. Use opaque tanks (if tanks are used).
- 3) Paint existing plastic tanks with white paint (outdoor oil base is best).
- 4) Indirect (reflected) UV can be significant, so tanks that are outdoors must be opaque.
- 5) Do not use clear tubing or hoses for any product feed or pumping process.

Contact us for further technical information. We'd be pleased to help or advise.