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The BIT Experience & Update

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Until July 27, 2018 many of us had little interest nor knowledge of the intricacies of biocide structure, activity and supply chains.

Then began the BIT saga.....



Outline of “THE BIT EXPERIENCE”

Chemistry

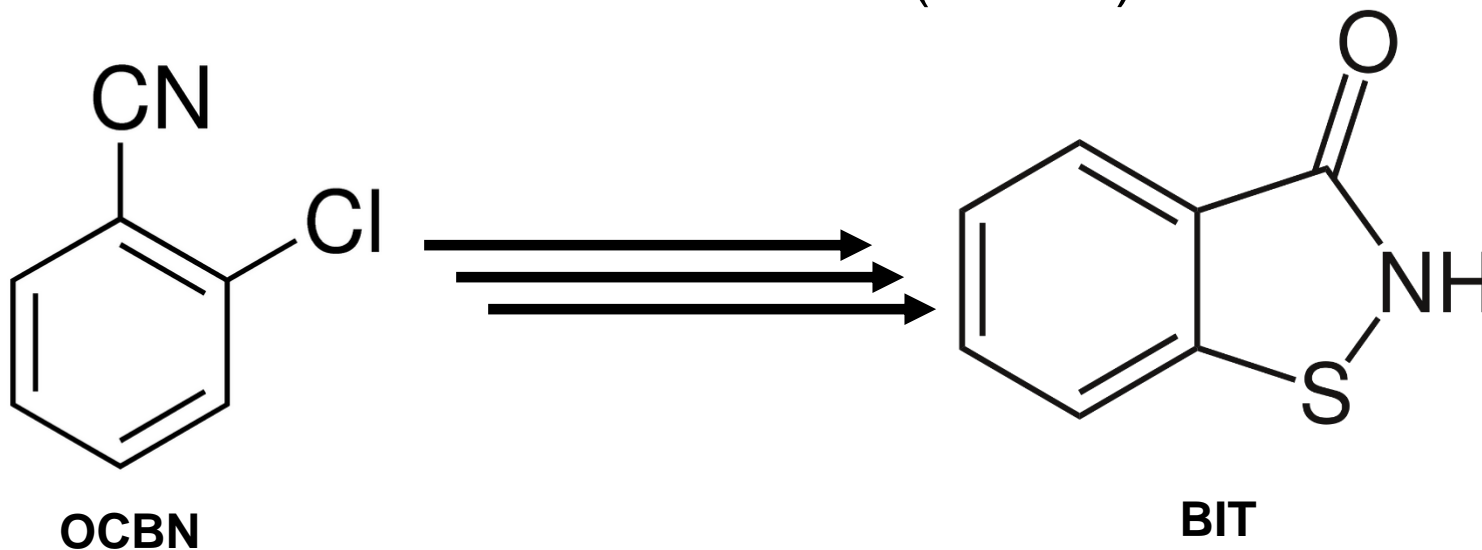
Uses

Alternatives

Industry and EPA response



BIT is benzisothiazolinone which is made using the starting material *ortho* chlorobenzonitrile (OCBN)





- OCBN is either exported for conversion or converted in China to produce BIT paste of 80% purity.
- The BIT paste is let down into formulations to produce a typical 20% end use product.
- Almost all of the world's supply of precursor comes from China and a large % comes from one industrial park in Jiangsu province.



BIT uses:

- BIT is a broad-spectrum microbicide effective in aqueous systems over a broad pH range.
- Effective against fungi, molds, algae and bacteria, it is the preferred biocide for alkaline pH.
- BIT is used in a plethora of products including paints, consumer products, I&I and other industrial uses as well as agriculture. Ag uses a small % of total consumption



BIT alternatives approved for 180.920 use

Chloroisothiazolinone – CIT

Methylisothiazolinone - MIT

Bronopol

Dowicil 150



Alternatives to BIT

- If pH is <8 a blend of CIT/MIT is effective, however at higher pH's CIT decomposes
- Above pH 8, the adamantane derivative exemplified by Dowicil 150 is effective
 - Dow has discontinued this product recently.
- Bronopol is highly effective against bacteria only
- Blends of CIT/MIT/Bronopol are approved and available



Timeline of how CPDA worked for you to get the issue resolved:

Tip of the Hat to Gary Halvorsen who worked on this continuously with CLA, RISE and EPA to resolved the issue.

Thanks to Allen Las of Adama for his close working relationship with CPDA.



In July 2018 it was announced that the industrial park where OCBN is manufactured was shut down for environmental reasons following an audit.

BIT suppliers immediately went to allocations for existing customers.

TIMELINE:

- CPDA alerted members on **July 27**, and a draft initial request to EPA for regulatory relief was in that email.
- **August 1** “the Agency has developed a resolution to this situation, which is working its way through the approval process. He didn’t mention a completion date, but they are well aware of the urgency.”



- **August 14** - initial CPDA request for BIT relief
- **August 15** – sent to EPA

- **Sept 6** – EPA/CPDA/CLA meeting – list of alternate BIT products started
- **Sept 13** – CLA gives draft list of alternate BIT products to EPA
- **Sept 14** – CPDA says strategy inadequate, need other chemistries

- **Oct 3** – WSDA weighs in
- **Oct 18** – revised EPA memo , only lists BIT containing alternate products, now clear BIT isn't available. Not useful
- **Oct 30** – conference call. CPDA says this not working



- **Nov 7** – revised proposal from CPDA/CLA
- **Nov 8** – final proposal submitted

- **Dec 13** – final proposal approved in principal, needs management sign off
- **Dec 19** – Last minute changes, delay
- **Dec 21** – Approval !
- **Dec 22** - SHUTDOWN



- CPDA members can submit letters to the EPA self-certifying they are replacing BIT with CIT/MIT/Bronopol/Dowicil.
- The only other changes allowed is to adjust water content as needed.
- This notification is good for two years, then must revert to BIT or submit new CSF



- As BIT resupply grew, this could have been a historical footnote.
- Except on March 26 we received the news of a tragic accident at the Jiangsu industrial park. A very large explosion killed over 100 people, with several hundred injuries. Sadly the bodies of 28 workers could not be recovered.
- Seismologists report the explosion registered 2.2 on the Richter scale.



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- Initial reports were the OCBN plant was 1.2 km from the explosion and had received damage. No timeline for reopening.
- However, on April 4 the regional government announced the park would be permanently closed.
- No report of any actions to alleviate OCBN supply. At least 80% of the world's supply is offline permanently.



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It is too soon to determine if an extension past Dec 2020 is needed, or if EPA will require new CSF's.

CPDA will stay on top of this issue.



ACTIONS:

- 1) Qualify alternate biocides in your formulas ASAP
- 2) Good results with CIT/MIT have been obtained where pH is <8
- 3) Save your BIT for high pH products. Dowicil 150 is disappearing. Other biocides for high pH need to be vetted.
- 4) Submit notification letters to EPA – for pesticides, letter should go to product manager. For inert packages to Inerts Branch.



Lessons Learned

- Must understand biocide chemistry better
 - pH, efficacy, concentrations, regulation
- Re-define single sourcing
 - Not just a single company any more, but a single region can have the same effect
 - Not just China, but globally
- If an ingredient is an “afterthought” it is easy to overlook supply chain fragility



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BONUS MATERIAL !!

Brief summary of recent CPDA
Dialog with WSDA



In 2018 WSDA announced effort to examine nomenclature for use with PFA on adjuvant labels.

One proposed idea was to require the use of IUPAC chemical names for PFA

The idea was to promote transparency for the end user with full disclosure of the contents of a product.



A meeting was arranged by CPDA and collaborators on November 4/5 2018 between CPDA members and WSDA staff.

A unified front from industry, including WPHA and FFF and non CPDA members, discussed candidly concerns with the nomenclature proposal.



Objections were raised by CPDA members, many of which concerned confidentiality of formulas.

A second objection was a resulting **lack of transparency** - the use of IUPAC names would be confusing rather than educational.

Resulting “word salad” would not clarify ingredients to growers



The following example was proposed (thanks to Andy Chang of WE)

Which name is more instructive to an end user?

(RS)-2-(4-(2-methylpropyl)phenyl propionic acid

OR

IBUPROFEN



A more forceful comment was also presented:

IF this proposal was implemented, certain companies would not introduce new technologies into Washington State because IP would not be protected.

A CPDA survey gave strong support to this position with a majority of companies adopting this stance.

CPDA coordinated the industry pushback



Industry wanted a list of reasonable synonyms that would allow for product differentiation in market.

A one-size-fits-all list of PFA names was not acceptable.



Initial follow-up discussions concerned oils used in COC and how they should be described – aromatic, paraffinic, hydrocracked, solvent refined, mineral oil etc.

We sought a common nomenclature that would allow for clearly defined synonyms

Discussion eventually grew to all classes of adjuvant materials.



On April 15 2019 WSDA released a spreadsheet with the following hierarchy of allowed names

First – Chemical Name

Second - allowed synonym

Third – chemical class

PFA names can be chosen from any hierarchy



EXAMPLE

Alcohols, C12-16,ethoxylated **Chemical Name**

Alpha-Alkyl (C12-C16)-omega-hydroxypoly(oxyethylene) **Synonym**

Alcohol ethoxylate **Chemical Class**



CAVEATS:

- 1) Not all allowed ingredients have all three possible names.

chemical name	sodium lauryl ether sulfate
synonym	sodium laureth sulfate
chemical class	“none”

OR

chemical name	soybean oil
synonym	“none”
chemical class	seed oil



Several current ingredients are disallowed

Bases have no synonyms or class

There are a few tricky details – no time to

List is not perfect, and comments are accepted until May 15.

WSDA will listen to a unified industry voice



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Thank You



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