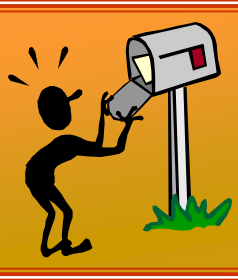
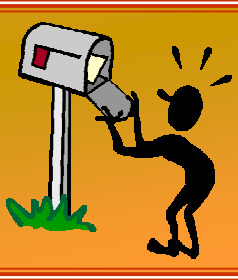


SAFEX NEWSLETTER
No. 26 September 2008



CONTENTS

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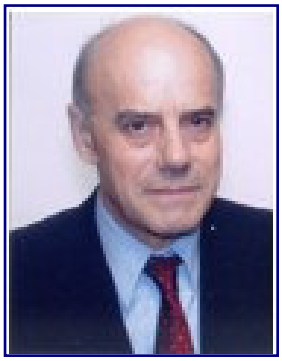
About this Newsletter

In our *Meet the Governors* feature we introduce another one of our newly elected Governors, Jean-Yves Canihac. *Our Incident Reporting Performance* highlights the exceptionally quiet quarter we had as far as incident reports are concerned. As we intend canvassing members' opinions about the frequency and venue for future Congresses, we raise the relevant issues in the feature titled *Future Congresses*. We urge members to respond to the Survey when they receive it. Ben Barrett provides an update on the 6(d) Test in *Our Regulatory World*. In his article in *From CERL's Research Notes*, Phil Lightfoot looks at the effect of acidity and additives on the thermal stability of ammonium nitrate solutions. The Newsletter concludes with two local snippets: The first one draws your attention to the video clips on the SAFEX Intranet which one of our members submitted as a *Discussion Topic* to the Workgroup dealing with explosives remediation and decontamination. In the second one we invite you to contribute to the good practice guides summarized in the recent *Topical Paper (No. 5)* on emulsion manufacturing hazards.

Meet the Governors

Jean-Yves Canihac



Jean-Yves is a graduate electronic engineer.

He worked from 1969 to 2004 in various capacities in the SNPE Group. When asked about these jobs he modesty replies: "I was involved in environmental testing and developing special buoyancy material for submarine applications." He also held various assignments in propellant manufacture which is where he made his mark. Not only was he the R&D engineer involved in developing a continuous double base propellant process but also became responsible for the operation of the plant. Subsequently he became the R&D engineer for the air bags propellant manufacturing process.

If you think Jean-Yves is just a technocrat, you're wrong. He is very much a people person as one can expect from someone who is so steeped in explosives manufacture. The SNPE Group recognized it when they made him the Human Resources director. This was followed by his appointment as Managing Director of an explosives plant in France and Belgium. Not long thereafter he became CEO of Nobel Explosifs France and then CEO of Pyroalliance.

2004 was a turning point for him when he was appointed Managing Director of Nitrochimie with responsibility for the operations of the EPC Group in Belgium, France and West Africa.

Jean-Yves is the proud father of 4 girls and, as he puts it in his inimitable way, "I taste the pleasure of being a grandfather to 8 grandchildren."

Incident Reporting

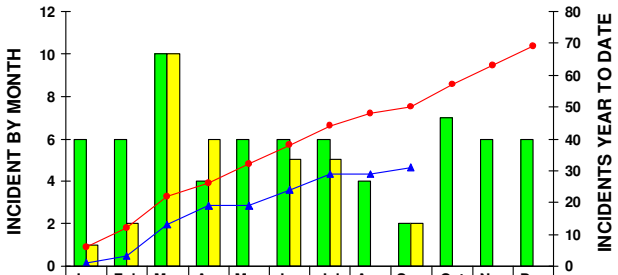
Monitoring our Reporting Performance

"It is never too late to report an incident"

SAFEX extracts much of its learning from Incident Reporting which is vital to the services it offers. In order to track how well we do in this crucial area we measure our reporting performance by way of the following charts:

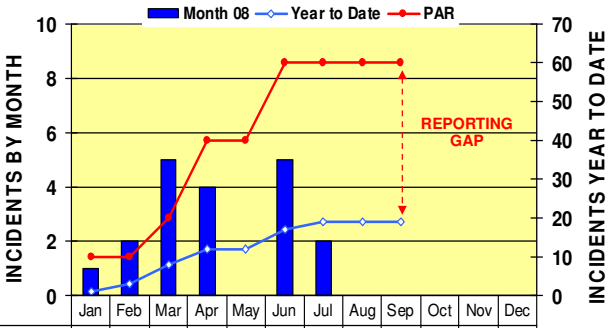
All the incidents reported. This chart takes the sum of non-member and member incidents reported to SAFEX every month this year and compares it to the previous year. As you see in the chart below, we have had a very quiet quarter. The question is: Are we having fewer incidents or are there incidents that have gone unreported. If we are having fewer incidents it is a reason to celebrate. However, if we have not been as diligent in reporting them, let's get the reports out. It is never too late to report any incident as the learning points from the incidents are timeless.

ALL INCIDENTS REPORTED 2007 VS 2008



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Month 07	6	6	10	4	6	6	6	4	2	7	6	6
Month 08	1	2	10	6	0	5	5	0	2			
YTD 07	6	12	22	26	32	38	44	48	50	57	63	69
YTD 08	1	3	13	19	19	24	29	29	31			

MEMBER INCIDENTS REPORTED: 2008



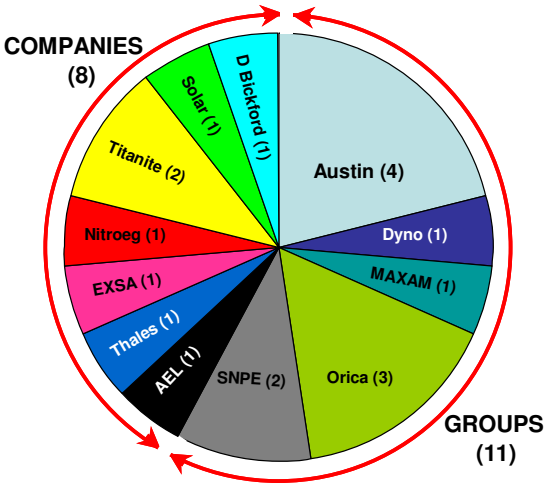
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Month 08	1	2	5	4	0	5	2	0	0			
Year to Date	1	3	8	12	12	17	19	19	19			
PAR	10	10	20	40	40	60	60	60	60			

Member incidents reported. We track separately the number of incidents members themselves experience and of which we are notified. These incidents are usually well investigated and yield valuable learning points as a result. For this reason we place a premium on Member Incidents (MI's) reported. Using the severity of our MI's we estimate how many MI's are occurring and call this indicator PAR. The gap between the number of MI's reported and PAR is an estimate of our Reporting Gap. Our Reporting Gap suggests that only 1 out of 3 MI's are being reported. We are, therefore, missing out on 66% of the possible learning opportunities.

Contributors of member incidents. This chart identifies those members who have taken the trouble to report their incidents. It shows the number of incidents each of those members have reported relative to the total number of reports received. The chart distinguishes between Groups and Companies merely to indicate the performance of the two membership categories. Each category has about the same number of operating units.

SAFEX is indebted to these members for making the effort to report their MI's.

CONTRIBUTORS: MEMBER INCIDENTS YTD SEP 2008



SAFEX Congresses

We need your help

"Look out for the Survey regarding the next Congress"

The SAFEX Congress is held every three years. Congress venues have traditionally been located in major European cities. The main reason being that Europe is believed to be the most accessible region for the majority of our members coming from all parts of the world.

At our most recent Congress some members felt we should hold the Congress every two years. When the SAFEX Board of Governors meets early next year it must decide **when** and **where** to hold the next Congress. The Board would like to know what most of our members feel about this issue before they discuss it.

We have decided, therefore, to use a mini-survey to canvass members' opinion about:

- The frequency at which we hold SAFEX Congresses.
- The venue for the next and subsequent Congresses

May we urge all members and associates to let us have their responses when they receive the survey early in October.

You may wish to consider the following factors in deciding on your responses:

Congress Frequency

- The review of incidents is a significant element of every SAFEX Congress. To hold more frequent Congresses we must receive sufficient reported incidents from which members can learn. We also require members / delegates willing to present such incidents at the plenary sessions.
- More frequent Congresses would allow additional items or issues to be dealt with or standing items to be addressed in more detail.
- Congress costs are recovered from the annual membership fees. More frequent Congresses will have a cost impact.

Congress Venue

- The venue must be readily accessible at optimal cost for members from all parts of the world.
- It must be located in or close to a city which is well-served by international airlines.
- It must have the necessary infrastructure to support an international Congress.
- The language at Congress is English and the people with whom we work at the venue should be reasonably proficient in English.
- There should be sufficient attractions for a Social Programme.

Our Explosives Regulatory World

This feature is written by Ben Barrett, an Expert Panel member, who is an independent consultant specializing in regulation of explosives. DG Advisor, Ben's consultancy, is dedicated to participation in the development and modification of international dangerous goods regulations and helping clients comply with US and international regulations.

Report from the UN Explosives Working Group – Update on 6(d) Test

The UN Sub-Committee of Experts on the Transport of Dangerous Goods (UNSCETDG) met from June 30th through July 9th, 2008 in their 3rd meeting of the biennium which ends this December. Based on the actions of this committee, the UN Model Regulations for the Transport of Dangerous Goods is revised and reissued after each biennium. The UNSCETDG typically has a breakout group each July which deals with explosives - the Explosives Working Group (EWG). Proposals concerning explosives are delegated to the working group, which then synthesizes a consensus when possible, and reports back to the plenary meeting of the Sub-Committee. This July the group dealt with a new "6(d) Unconfined Package Test" for 1.4S classification; clarification of the criteria for excluding articles from Class 1; desensitized explosives; and eleven miscellaneous issues.

The 6(d) test is a significant project for the EWG, and has been in the development and debate stage for years (see the previous article on this Test in *Our Regulatory World* in the December 2007 issue of the SAFEX Newsletter). This project is significant for two reasons: (a) its intent is to exclude articles exhibiting certain behavior from being classed as 1.4S; and (b) the definition of 1.4S has been examined as part of the project. Explosives in Division 1.4S have many dispensations throughout the international and domestic transport regulations, such as exceptions for labeling, placarding, container serviceability, port acceptance, passenger aircraft shipment, etc. Therefore, 1.4S products are easier to ship and exclusion of a product from 1.4S may add significant expense. Debate centers on whether the safety benefit is real and justifies the expense. It seems that a majority of the group, but not all, thinks that the new test is needed.

The definition of Compatibility Group S is:

Substance or article so packed or designed that any hazardous effects arising from accidental functioning are confined within the package unless the package has been degraded by fire, in which case all blast or projection effects are limited to the extent that they do not significantly hinder or prohibit fire fighting or other emergency response efforts in the immediate vicinity of the package.

The group discussed that the definition actually has two parts with different criteria. Functioning during a fire has long been evaluated using the 6(c) bonfire test, in which case the results must not significantly hinder fire fighting etc. However proponents of the proposed 6(d) test say that there has been no test to evaluate hazardous effects outside the package when the package has not been degraded by fire.

The existing 6(a) single package test determines if adjacent articles in a package are ignited when one of the articles is intentionally ignited, i.e. it determines whether there is a mass explosion. To simulate shipment conditions, the 6(a) test package is confined and the confining material (e.g. sand or dirt) may reduce or obscure hazardous effects outside the package. The proposed 6(d) test is basically an unconfined 6(a) test with specialized criteria to evaluate hazardous effects outside the package. A key point is what separates any effect, e.g. a wisp of smoke or slight rupture of a package, from a "hazardous effect". The development of these test criteria has therefore clarified "hazardous effect" in the 1.4S definition. The same four proposed criteria are still intact. However, in July the EWG modified them to be more stringent, keeping in mind that these products may be shipped on a passenger aircraft. Evidence of a hazardous effect outside the package is now proposed as:

(a) Denting or perforation of the witness plate beneath the package;
(b) A flash or flame capable of igniting an adjacent material [such as a sheet of 80 ± 3 g/m² paper at a distance of 25 cm from the package];
(c) Disruption of the package causing projection of the explosives contents; or
(d) A projection which passes completely through the packaging (a projection or fragment retained or stuck in the wall of the packaging is considered as non hazardous);

The previous proposed criterion prohibiting significant scattering of the contents was modified into a different concept - that the scattering of un-ignited explosive articles outside the package is a hazardous effect, even if there is no ignition or strong physical effect, because of the potential danger of explosives laying around. Also new is the concept that an adjacent package should not catch fire, which replaces the previous proposed criterion limiting the size of a fire ball or jet to one meter.

In addition to modifying the test criteria, the EWG also decided that the test would only apply to eight (8) articles in the List of Dangerous Goods:

UN0323: Cartridges, power device
UN0366: Detonators for ammunition
UN0441: Charges, shaped
UN0445: Charges, explosive, commercial
UN0455: Detonators, non-electric
UN0456: Detonators, electric
UN0460: Charges, bursting, plastics bonded
UN0500: Detonator assemblies, non electric

Other articles would be excluded from the test. As always, competent authorities have the ability to waive or require testing based on their judgment. For example, "UN 0323 Cartridges, power device" have a wide variation in net explosives weight, and while they may fail at 300g, experience may indicate that there is no need to incur test fees for a small 1g article or other situation where failure is unlikely.

It appears that the 6(d) test may be incorporated into the 2009 revision of the UN Model Regulations after the end of the biennium this December. Examples of pass or failure of articles are shown in the table below.

Table showing examples of Pass or Failure of articles

Article	Packaging	Initiation system	Events	Result
Cartridges, power device	Fibreboard box containing 20 articles (300 g of propellant each) each in a plastic bag.	One of the articles.	Articles ignited one by one, producing flames up to 2 m high outside package.	Not consistent with Compatibility Group S.
Detonator assemblies, non-electric	Fibreboard box containing 60 assemblies each in a plastic bag with its shock tube coiled in a figure 8, with attenuators on the detonators.	One of the articles.	One out of 60 detonators fired and no visible effects outside the box.	Consistent with Compatibility Group S.
Detonators, electric	Fibreboard box containing 84 assemblies, each bundled with its wire so that the blast from a firing detonator would be attenuated.	One of the articles.	One out of 84 detonators fired. The reaction caused the box to break open and released some of the assemblies but it was judged that there were no hazardous effects outside the package.	Consistent with Compatibility Group S.
Charges, shaped (open-face 19 g perforators)	Fibreboard box containing 50 charges in two layers so that pairs of charges were focused toward each other.	Detonator with approximatel y 60 mm of detonating cord.	Three trials were conducted. In each of the trials, the witness plate was perforated with three to four charges reacting. The packages were blown apart scattering the remaining charges over a wide area.	Not consistent with Compatibility Group S.
Detonators, electric	Fibreboard box containing 50 detonators each with a 450-mm lead wire. Each assembly was contained in its own fibreboard inner box. The boxes were separated by fibreboard panels.	One of the articles.	One out of 50 detonators fired causing one of the box flaps to open. There were no hazardous effects outside of the package.	Consistent with Compatibility Group S

Other topics discussed by the EWG which resulted in adopting a change were:

- A definition for "phlegmatized" was added
- The dangerous goods listing of Hydroxybenzotriazole was modified to recognize the monohydrate version of this chemical as a flammable solid, as opposed to an explosive.

TDG approved suggested changes to the Globally Harmonized System of Classification and Labeling of Chemicals (GHS) classification procedure for ammonium nitrate emulsions and submitted them to the GHS Sub-Committee, which will review them in December. These changes specify that ANE oxidizing liquids or solids will be classed as

Category 2, resulting in the packaging Signal Word "Danger" and the Hazard Statement "May intensify fire; oxidizer". See the GHS book chapters 2.13 and 2.14 for more information.

Discussion of new classification regulations for desensitized explosives was deferred to the next meeting of the UNSCETDG in December, when their Informal Working Group on Desensitized Explosives will convene in parallel.

From CERL's Research Notes

Effect of Acidity and Additives on the Thermal Stability of Ammonium Nitrate Solutions

Introduction

The thermal stability of ammonium nitrate solutions (ANS) is of considerable importance to the explosives industry. ANS are handled in bulk and at elevated temperatures that can be close to their onset for thermal runaway, particularly for the highly concentrated solutions/melts that are used for prill manufacture. For example, to increase the dissolved AN concentration from 80 to 97 w/w%, the temperature of the solution must increase from 60°C to ~130°C. There are many examples of accidents involving the thermal decomposition of ANS, particularly when contaminants are present and we get regular requests at CERL to test the stability of ANS.

One key factor affecting the stability of ANS is acidity. It is generally well known that AN in solution produces nitric acid through the following dissociative equilibrium:

$$NH_4NO_3 \Leftrightarrow NH_3 + HNO_3$$

Nitric acid is a strong mineral acid and dissociates to hydronium ions (H_3O^+) in solution. A solution with low pH value indicates high acidity, i.e., high concentration of H_3O^+. A safety concern arises since it is known that the thermal decomposition of AN is catalysed by acid. Manufacturing incidents have occurred when ANS are stored at low pH. Although, operating at pH = 5 is generally thought to avoid these decomposition conditions, there is a need to systematically assess the effect of pH on ANS.

In this article, we examine how pH affects the thermal stability of ANS at high temperature. This turns out to be a non-trivial exercise, as it is not straightforward to measure or control the pH of highly concentrated, hot solutions. Lastly, since manufacturers rarely store pure ANS, we examine the effect of some common additives on their pH and thermal stability. To do this, we separately measured pH of hot ANS, and then used Accelerating Rate Calorimetry (ARC) to assess thermal stability.

The work reported here was carried in partnership with Orica Mining Services, as part of a significant joint program on explosives hazards.

Experimental

The experimental apparatus to monitor pH of ANS as they are being dissolved and titrated with strong acid or base is shown in Figure 1, p 7. A recently available pH probe, able to operate at high temperatures with real time data acquisition every five seconds, was used (Mettler Toledo InPro 4250). The reaction vessel size was limited to 100 ml, being a reasonable scale for safe containment within a fumehood in case of an experimental runaway. The operation was also remotely controlled.

This experimental design required some modification during the

Figure 1a: *Titration equipment assembled in fumehood. Communication cables for remote control of each item led to a computer in a next-door control room. A webcam was used for real-time monitoring of the reaction vessel.*

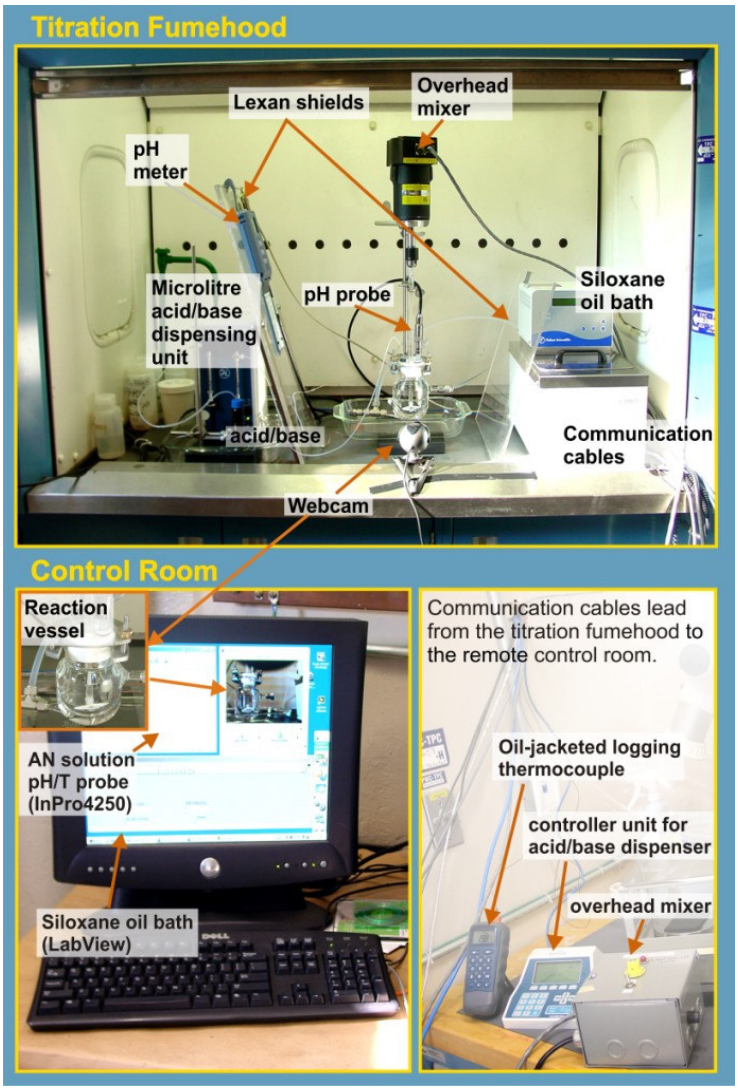


Figure 1b: *pH/T probe new and after high temperature cycling abuse.*

various titrations to accommodate the increasingly concentrated ANS. A Teflon stirrer shaft replaced the more fragile glass shaft for ANS > 90%. When ANS of 97% were titrated, the 130°C operating tolerance of this pH probe became important. The electrolyte and probe response degraded with exposure to high temperature and the highly ionic AN solution. Shown in Figure 1b is the probe before and after repeated and lengthy use > 120°C. Since the completion of these experiments, more robust pH probes have appeared on the market with a higher temperature operating limit (Emerson Process Management). Titrations were performed with and without the presence of an additive. Three additives (two organic and one inorganic) were examined:

1) PS-SO_3 – a solution of a sulphonated polystyrene containing ammonium sulphate
2) Ar-SO_3 – a solution of a sulphonated naphthalene containing sodium sulphate
3) $Al_2(SO_4)_3$ - aluminum sulphate

Individual solutions having AN concentrations from 80 to 97 mass% and containing up to 2000 ppm of an additive were titrated. Note that typical additive concentrations in practice are well below 2000 ppm, so the latter represents an extreme process deviation. The temperature required for these mixtures to dissolve ranged from 60°C to 128°C. The amount of acid required to bring these ANS down to a pH of 1, or base required to bring these solutions up to a pH of 5, was determined. For thermal stability testing using the ARC, a fresh sample of the AN mixture was made up to the pH level of interest by simply adding the appropriate total amount of acid (or base) indicated by the titration, to a room temperature sample of AN, water and additive.

The ARC technique to measure the thermal stability of solutions was described in detail in the SAFEX Newsletter in June 2007. Briefly, the sample is heated in 5°C increments and the ARC searches for differences in temperature between the sample and surroundings. If sample self-heating events occur, then the surroundings are kept adiabatic and the self-heating event is allowed to proceed until preset shutdown conditions are reached. All ARC tests were carried out in closed sample vessels, i.e., no gases were allowed to escape.

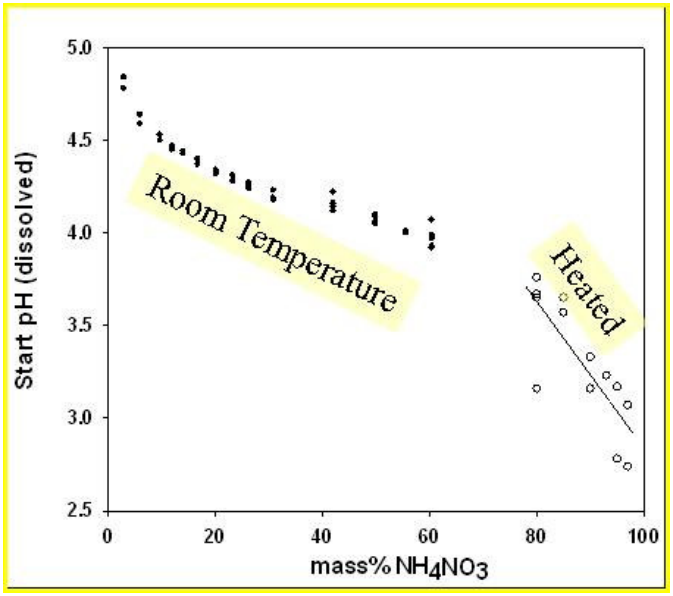
Controlling the pH of ANS

Figure 2 shows the pH as the concentration of AN was increased in a water solution. The slow drop in pH for room temperature solutions with increasing concentration indicated a gradually increasing amount of acid being dissociated from the AN and remaining in solution. When the solutions required heating to dissolve, the drop in pH was not as gradual. A ten-fold increase in the acid content occurred between 80% and 97% AN solution. As shown, the natural tendency of ANS is to be acidic (pH < 7). At constant temperature and under the partially vented conditions of the reaction vessel, the pH value remained constant once the AN was in solution. This is important to note since it showed the acidity of AN solution remained constant within the timeframe of these pH measurements (about 1 h), so the measurements are taken under conditions that are close to steady-state. However, it is worth remembering that, in practical situations, where storage times are much longer than an hour, it is known that ANS can self-acidify, by loss of ammonia.

Real-time data collection during an AN solution melt and acid titration is shown in Figure 3. Once melted, the titration of the solution started. In the example shown alongside, the pH at the start of titration was ~3.1 at 130°C and dropped to pH=1 upon addition of a total of 84 microlitres of concentrated nitric acid. Note that pH is a log scale, so a drop of 2.1 pH units corresponds to an increase of acidity of more than two orders of magnitude. Calculations (assumptions of density, volume, etc.) show that the addition of the acid in this case should theoretically lower the pH to 1.6, rather than 1. This four-fold difference in theoretical and measured amount of acid present suggests that the addition of acid promotes further dissociation of AN to produce even more acid. The same effect was seen consistently for concentrated ANS. While this result may seem counterintuitive, the physical chemistry of ANS is complex, with many interconnected physical and chemical equilibria in play, and it is well known that the decomposition of AN is acid-catalysed.

Figure 4, p 9 shows the results of titration experiments for 97% and 80% pure ANS, although AN concentrations between the two

Figure 2. *The pH of ≤60% w/w ANS measured at room temperature. The pH of solutions ≥ 80% w/w AN was measured at the temperature needed for dissolution.*



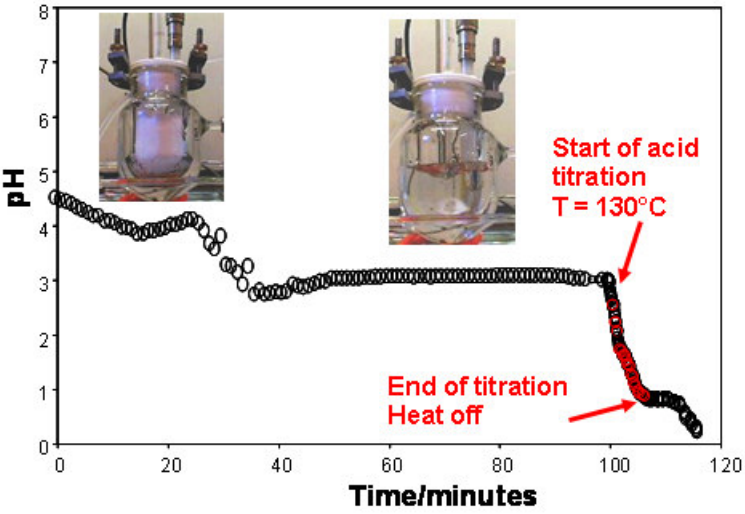
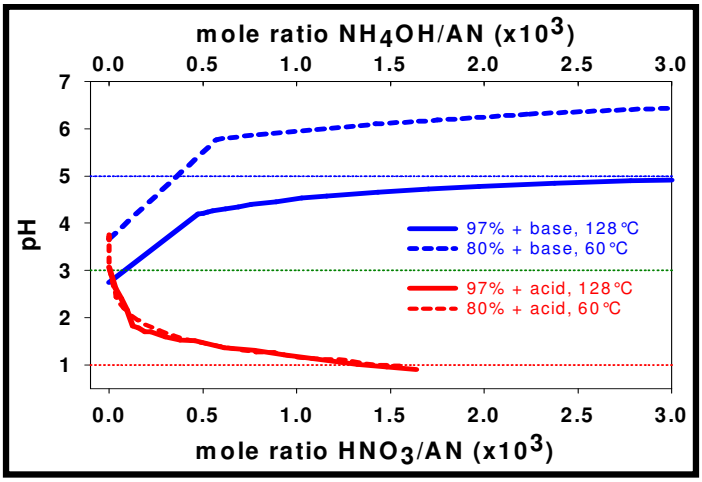


Figure 3. *Time and pH data collected over the timeframe of the experiment. Data collection started at room temperature (undissolved solution) and continued through the melting, titration and cool-down of the sample. Webcam photo inserts show the glass reaction vessel loaded with 97% AN and 3% water at room temperature, then dissolved at 130°C. Note that the custom-made solid Teflon lid allowed venting of gases through the various fitted inlets required for pH/T probe, stirrer and titration tube inlet.*

were also tested. Base titrations showed a systematic difference in response as AN concentration was increased. The amount of base needed to bring the measured pH up to 5 increased with increasing AN concentration. This is in accordance with the results of Figure 2, where it was shown that the average starting pH of the 80% solution was already higher than that of the 97% AN solution, requiring less base to increase the pH to 5. Although not shown in Figure 4, the base titration behaviour of the ANS 85, 90 and 95

Figure 4. *Results from four titration experiments. X-axis are the ratios of titrant to AN in solution, y-axis is pH.*



mass% lie between these two results. The acid titrations did not show this definite trend. In the example shown in Figure 4, both solutions required a similar amount of acid to reach a pH of 1, and indeed all the AN concentrations examined gave similar results. Again referring to Figure 2, the pH of the starting solutions were incrementally lower as the concentration of AN increased, yet the amount of acid added to any of these solutions to reach pH=1 was similar. As discussed above, we believe that addition of acid may further promote the dissociation of AN to form more acid. Without any acid addition, these ANS remained at stable pH at the temperature of dissolution. Further work would be needed to account for the mechanisms by which the added acid promotes AN dissociation.

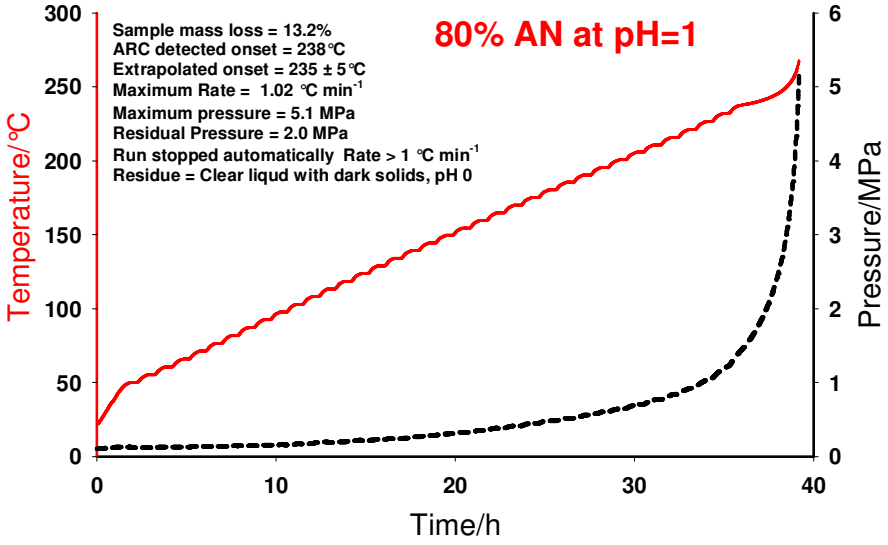


Figure 5. *Temperature and pressure data as collected from the ARC for a solution of 80% AN made to be pH =1 with the correct quantity of nitric acid indicated by the titration experiment above*

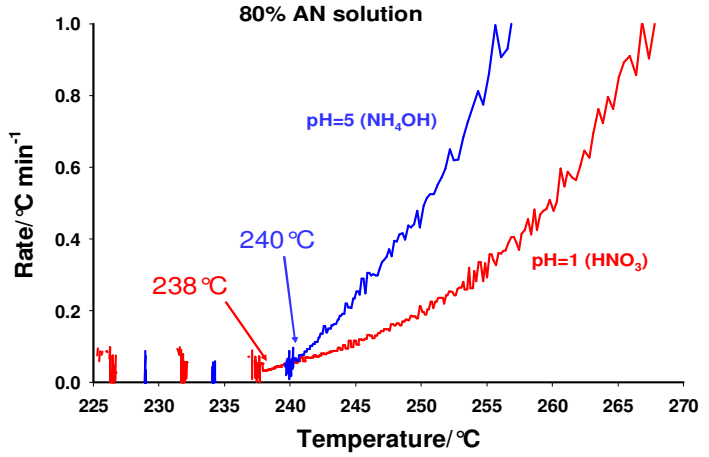


Figure 6. *Self-Heating Rate vs. Temperature for two samples of 80% AN at the indicated pH. Arrows indicate ARC detected onset temperatures.*

Thermal Stability of ANS at known starting pH

Thermal stability of the series of ANS described above was assessed using Accelerating Rate Calorimetry. A typical result is shown in Figure 5. To determine self-heating rates, the derivative of the temperature data with respect to time is used. Figure 6 shows this transformed data.

The temperature at which self-heating was detected by the ARC is given as the ARC detected onset temperature. This onset temperature is taken as the onset to thermal decomposition.

A comparison of this temperature for all pure ANS made to be a specific pH is shown in Figure 7 on p 10. As can be seen in Figure

7, solutions at pH =1 showed a definite trend of decreasing thermal stability as the concentration of AN increased. As the starting pH was increased, the onset to thermal decomposition occurred at higher temperatures. The 80% solutions showed approximately the same decomposition temperature (240°C) at all pH values. As the mass % of AN increased, the pH had a greater effect upon thermal decomposition with pH=1 being the most susceptible to thermal decomposition and pH=5 being the least. For example, there is approximately a 30°C difference between the decomposition of a 95% AN solution at pH=1 than at pH=5.

Figure 8 shows how the onset temperature measured by ARC varies for AN systems containing the inorganic additive, $Al_2(SO_4)_3$. The results show the same general trend of the onset temperature decreasing with decreasing pH.

The last set of data, shown in Figure 9, compares the two organic additives. The onset to thermal decomposition is still detected to be approximately 30°C higher when using solutions starting at pH=5, rather than at pH=1. Most interesting is that the onset to decomposition of the pure ANS occurs at approximately the same temperature as the same solutions with additive. Although not shown, the same result was found for aluminium sulphate.

Figure 7. *ARC detected onset temperatures as measured using ANS at specific starting pH values.*

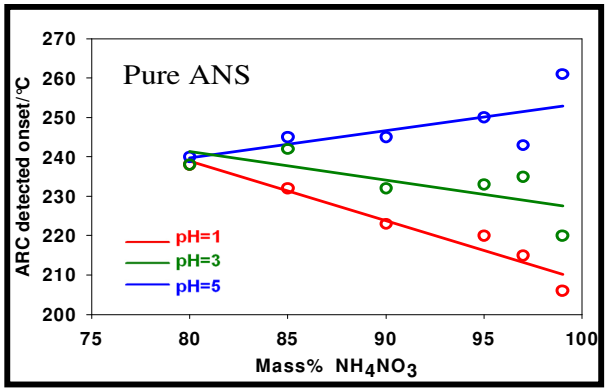


Figure 8. *ARC detected onset temperatures measured using ANS containing 0.2% $Al_2(SO_4)_3$ at specific starting pH values.*

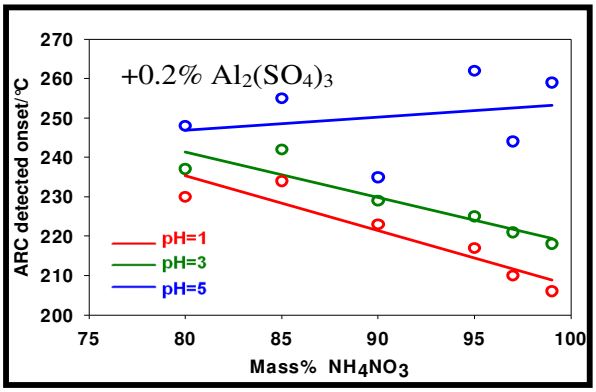
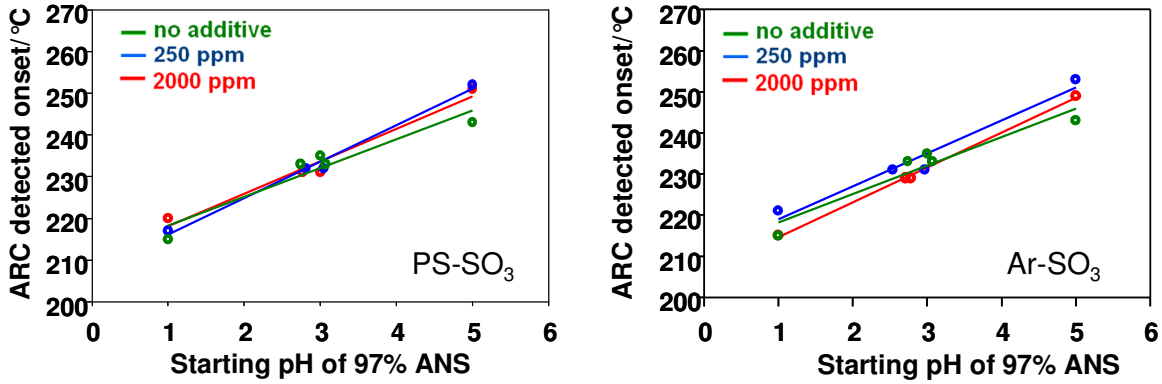


Figure 9. *ARC detected onset temperatures of 97% ANS at pH=1, 3, and 5 containing up to 0.2% organic additives.*



Conclusion

Finding the important variables to control AN decomposition reaction requires methodical study. Taken as a whole, the present ARC thermal stability data indicates that pH has a greater influence upon the onset to thermal decomposition than type, or quantity, of the particular additives which were present. For solutions held at pH=1, a pure AN solution showed the same (low) onset to thermal decomposition as an AN solution containing one of these additives. ANS at pH=3 show a slightly higher stability with respect to thermal decomposition, than at pH=1, but ANS at pH=5 consistently show the highest stability to thermal decomposition.

The effect of additional acid content is not straightforward, as demonstrated by the titration curves. The hot titration (and thermal decomposition) is a dynamic process, and species which develop and persist in ANS continuously perturb the complex chemical system. The details of this shifting equilibrium, however, may not be as important as knowing to avoid these conditions by not operating at low pH

SAFEX Snippets

Nitroerg shares test results

Janusz Drzyzga (Nitroerg, Poland) submitted the results of some elementary experiments they did on safely decontaminating Dreis mixers. It is a visual report comprising a series of video clips of tests using high pressure water to decontaminate machine parts. The question they tried to answer was:

Is it possible to use a high pressure water washer for cleaning equipment and facilities contaminated with explosives?

They performed the following tests in trying to answer this question:

1. Clean the metal parts of a cartridging machine contaminated with dynamite,
2. Clean the agitator of a Dreis mixer covered with gum and contaminated with dynamite.

Janusz thought their unexpected results may be of interest to SAFEX members.

Their contribution can be viewed on the SAFEX Intranet which Members can access via the SAFEX Website on www.safex-international.org. You will need your access codes to enter the Intranet. Please go to the *Workgroup* page and click *Discussion forum* under *Explosives Legacy Issues Workgroup*

If anybody has further questions or suggestions, they should feel free to contact Janusz Drzyzga at j.drzyzga@nitroerg.pl or comment using the facility provided for it on the *Discussion forum* Page

Topical Paper No.5 – Just the beginning

"We need your input on good practices"

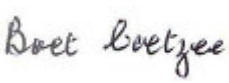
The recent SAFEX Topical Paper on the hazards of emulsion explosives manufacture has created a lot of interest. Andy Begg, the author, points out that the Paper is the first step in producing a "current good practice" guide with do's and don'ts. It therefore requires comment from readers on the issues raised in order to increasingly reflect what can be regarded as good practice. Furthermore, readers may have other views and perhaps some additional thoughts or issues that should be included.

This Paper should be continually updated as new ideas or information come to light. We appeal to all readers for their contributions and to let us have their suggestions for improving the Paper. In this way we can become co-authors of a Guide that will promote safety, health and environmental friendliness in our operations.

If you have not received a copy of the Paper or would like a PDF copy, please contact us at secretariat@safex-international.org

SAFEX International thanks the following for their contributions to this Newsletter:

- **Jean-Yves Canihac,** Governor of SAFEX
- **Dr Phil Lightfoot,** Manager, Canadian Explosives Research Laboratory
- **Ben Barrett,** member of the SAFEX Expert Panel



Boet Coetzee
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