

Proc. 435 Catalytic Reduction in Nitric Acid Plants of N₂O from Adipic Acid.

by G Kuhn, V Schumacher and E Wagner.

Transport Safety for Nitric Acid by Road and Rail.

by G Grunenberg, K Grimmer and V Schumacher.

Discussion following the presentation of the paper:

Anon, UK:

Do you expect this catalyst to be applied throughout the nitric acid industry? If not would you expect another catalyst to be applied and if so where in the process would that be?

Author(s):

At the moment there is a test run of the catalyst at Ludwigshafen and at Antwerp, and so far both tests are running very well. We don't see any indication that the catalyst is losing its activity, but the six months at the plant at Ludwigshafen and the three at Antwerp are not long enough for us to be able to say that we know all about it. In Antwerp there is not enough catalyst in the reactor. There is a residence time of only 0.02 seconds which is very little time and when we do the next test there we will double the amount of catalyst. At the moment it looks fine and I think everybody who wants to use this catalyst can get it from us.

David Heather, Fertiliser Manufacturers Association, UK:

In the second presentation you showed that you have very stringent safeguards relating to the contents of the tank - the nitric acid - but you showed on a number of occasions access to the top of the vehicles by the driver and the gatekeeper, for example checking that the lids are closed. Do you have any similarly detailed precautions and measures laid down for the safe access by personnel to the tops of the tankers themselves? The prevention of any accidents such as people falling off vehicles is an issue that's particularly live in the UK at the moment, and it would be interesting to know what your experiences are.

Author(s):

You can see in Figure 5 of the paper that access to the top of the tanker at filling is by way of a 'bridge' from the filling station that includes a frame of rails around the operating area. It is not possible to fall from the top of the tank.

Roger Dyson, Kemira, Ince, UK.

Another question related to the safety of access to the top of tankers. I see that you have the guarded area when you are filling, what about on discharge? Many tankers have bottom discharges and during transport they have what they call a foot-bath, which is actually located at the back and on the top of the

tanker where the valve is closed. What precautions are taken at the discharge point as opposed to the filling point?

Author(s):

Since an incident with the bottom discharge system on the road we try to avoid tankers with a bottom discharge system. For high concentration acid we just use those with a top discharge system. We have I believe two with a bottom discharge system, and these are only used for weak acid. Thus there can be a problem at discharge, but it's not done at the filling station and we are dependent on the driver. As far as I know every tank truck has a ladder and rails on the top. Of course the driver when working on the top has to use the rails; we cannot control it because it's not at our site. The driver must use the safety features of the tanker; he has the ladder and the rails and we hope these will be used. We can't control it. What do you do in the UK?

Roger Dyson, Kemira, Ince, UK:

We have a similar system. Most of the rails on the tops of tankers are one-sided so there is a hand-rail on one side, although I understand in Germany they are two sided. It is a problem to the industry, not just the fertiliser industry but the whole chemical industry. It's currently a hot topic.

Ken Sharples, Retired, UK:

I understand that you hire transport for nitric acid. Can I ask why BASF don't have their own tankers and so avoid the risks associated with contracting out to haulage firms? On another point, do you ever use ISO-tanks filled with the nitric acid transported on standard low loading trailers?

Author(s):

First, why doesn't BASF use their own tanker transport? I don't see that it's any safer if we use our own tankers for this special job. The tankers and the haulage procedures are specialised for this job and we only use contractors who are certified. In this way we are sure that they are using the right materials and that the drivers are trained correctly. That is the first point. I don't think it's only that it might be cheaper to use outside hauliers but I believe they have more experience in driving tankers. Furthermore the number of tankers we need is changing every day. It's impossible to have a large number of tank trucks waiting to make the next delivery of nitric acid, so I think it's better done by people who are specialised for this. Your second point concerned the use of tank containers; I don't see any reason why we should not use them but I don't see any advantage. They still have to be emptied at the customer's premises, and as you have seen there could be pressure problems for tanks with high-concentration acid if they are standing in the summer time without depressurising.

David Thompson, Consultant, UK:

Referring to my previous affiliation with what used to be ICI; we were members of the UK system 'Chemsafe'. In Germany is it BASF or is it your

haulage company that is a member of Chemsafe, or the German equivalent, TUIS I believe. In UK we started off with all the chemical companies providing everything, including the chemical experts, but in recent times the haulage companies who have the haulage knowledge and tanker experience are also providing expertise at the scene of an accident.

Author(s):

I think TUIS or Chemsafe should help if there are any accidents. For this you need people who know something about chemicals and how to handle them. BASF is a member of TUIS with some other chemical companies in Germany, and also the fire brigade of BASF is specially trained and equipped to handle dangerous chemicals. They have special plans to help TUIS and no haulage company will have a specialist fire brigade for assistance or for pumping material from one tank to another.

David Thompson, Consultant, UK:

In England the haulage companies themselves are now providing the transfer and pumping equipment, for example from a damaged tanker at a roadside incident, not just the chemical companies themselves.

Author(s):

It appears to be different in Germany, where it is just the chemical companies.

Anon, UK:

Where does the air extracted from the tankers during filling go? Is there a scrubbing system, and if so does it use just water or do you use hydrogen peroxide or other chemicals? Is there any fume extraction on the filling arm or is it just liquid going in?

Author(s):

The filling arm is for the acid going in and there is a suction pipe for extraction of the air and the gases. Also we saw in the photograph the device for checking the safe maximum filling level.

Anon, UK:

Where do the extracted gases go? Are they are scrubbed with water or hydrogen peroxide?

Author(s):

No. It is an advantage that at BASF Ludwigshafen we have the nitric plant, and this plant requires air. Thus the air extracted from the tankers is used within the nitric acid production again.

The Chairman thanked the speakers for the paper and the discussion.