

Explosion på en kemikaliefabrik

Start datum:980710

Händelse kod: DE/1998/005-[02]

Kort rapport

Typ av händelse

Explosiv diazo-sönderfall i en fabrik för produktion av färg och läder.

Inblandade ämnen

Explosiva substanser

Olycksobjekt

Under nattsiftet från 980709 till 980710 kondenserades oväntat en kristallinisk rest under en adiabatisk diazotization. Personalen betraktade denna rest som en förorening, vilket skall tas bort innan koppling. Därför transporterades enligt process tryck till kopplingspannan. Sedan trycket var fullt, transporterades (ca 50 %) till ett fat: den resterande 50 % beredes på morgonens skift. Under morgonskiftet upptäckte man att den innehöll en stor mängd diazon. Därefter kom omedelbart konstruktioner att tvätta kopplingspannan med vatten. Eftersom diazoniumsalt löses upp omedelbart i fall av friktion, måste det antas att rester bröts ned på grund av mekaniskt tryck, vilken orsakade explosion av rester i tuben.

Olycksobjekt

okänd

Skador

Händelsen orsakade materiella skador för ca: 2 500 000 till 3 000 000 euro.

Händelsen orsakade också en dödsolycka och 6 personer skadades och fem personer hamnade i chocktillstånd.

Akutåtgärder

Efter explosion gick larmsignalen och byggnaden utrymdes omedelbart.

Räddningstjänsten var på plats och andra byggnader i närheten utrymdes också.

Erfarenheter

Revision av liknande och motsvarande diazotationsprocesser involverade rening med brygning eller innehållande fasta substanser. Granskningen av resultatet av undersökningen visade att rengörande brygning av diazoniumsalt och liknande processer skall bli eliminerad. All processdokumentation relateras till produktionen av azoföreningar examinerades av en grupp experter vilka gjorde en riskanalys som baserades på dokumentationen.

De periodiska övningsmötena i samarbetet som ska testa snabbare tematisk och didaktisk.

Denna händelse måste betraktas som en varning mot risker involverade i hantering av diazoniumsaltlösningar.

English summary

Start date: 10/07/1998

Accident code: DE/1998/005-[02]

Accident type(s)

Explosive diazo-decomposition in a plant for the production of dyes for leather.

Substance(s) directly involved

Explosive substances

Immediate source(s) of accident

During the night shift from 9/07/98 to 10/07/98, unexpectedly a crystalline residue precipitated during an adiabatic diazotisation. The personnel considered this residue to be an impurity of the furnished amine, which would have to be removed by clarification before coupling. Therefore, according to the process a suspension was conveyed over a clarification press to the coupling kettle. Since the press was full, the content (about 50%) was transferred into a vat. The remaining 50% was filtered at the beginning of the morning shift, and remained in the clarification press.

During the morning shift, superiors found that the precipitate was not the expected residue of the amine, containing sulphur, but a large quantity of the diazo. Therefore, immediately instructions were issued to wash the coupling kettle and the clarification press with water, and to soak with water the transferred residue. During the inspection of the clarification press in the morning, about 2 kg of the material fell to the ground.

Since dry diazonium salts decompose immediately in case of mechanical blows or friction, it must be assumed that a part of the residue decomposed because of mechanical stress, which caused as a consequence the explosion of the main part of the residue in the tub.

Suspected Cause(s)

Unknown

Immediate effects

The event caused material damage for 2500000 to 3000000 EURO (two and a half million to three million EURO). This event caused one fatality, and six persons were injured. Additionally, five persons suffered a temporary shock.

Emergency measures taken

After this explosion, local alarm was immediately given and the building was evacuated. The on-site fire fighting team was alerted and other buildings in the neighbourhood were evacuated.

Immediate lessons learned

Revision of similar and corresponding diazotisation processes involving clarification by filtration or containing isolated solid substances. Consequent to the results of the investigation, clarification filtration of the diazonium salt and similar processes will be eliminated. All process documentation related to the production of azo compounds was examined by a team of experts, who carried out a new hazard analysis based on the documentation.

The periodical training sessions of the collaborators shall be further improved thematically and didactically.

This event should be considered as a warning against the risks involved in the handling of diazonium salt solutions. The explosion risk arising from crystallisation must be particularly emphasised.