

1

3,284,255

EXPLOSIVE INITIATOR COMPRISING BARIUM STYPHNATE AND LEAD AZIDE

Lewis Robert Rothstein, Keith Benner Mullin, and Wayne Eugene Jewsbury, all of Asheville, N.C., assignors, by mesne assignments, to Northrop Carolina, Inc., Swannanoa, N.C., a corporation of North Carolina
No Drawing. Filed July 1, 1965, Ser. No. 468,963
2 Claims. (Cl. 149-23)

This invention relates to the initiation of secondary explosives. It more particularly relates to an initiator for secondary explosives which initiator is at least as insensitive to detonation as the secondary explosive being initiated.

A certain class of explosive materials is known as secondary explosives. These include pentaerythritol tetranitrate, tetramethylene tetranitramine, trimethylene trinitramine and trinitrophenylmethylnitramine. These so-called secondary explosives are quite desirable in that they are not as dangerous to handle as the so-called primary explosives.

One of the problems which has plagued the art in this area is that secondary explosives must be detonated by an initiator. Until now, it has been though necessary to provide an initiator for this system which is a primary explosive and therefore more dangerous to handle than the secondary explosive being detonated.

It has now been found that a particular initiator can be provided to detonate secondary explosives, which initiator is no more dangerous to handle than the secondary explosive to be detonated.

The initiator according to this invention is a mixture of barium styphnate and lead azide. It should be noted that lead azide is a primary explosive which by itself is more dangerous to handle than the secondary explosives which it will initiate. The mixture then of barium styphnate and lead azide has sufficient explosive power to detonate pentaerythritol tetranitrate, tetramethylene tetranitramine, trimethylene trinitramine, and trinitrophenyl-methylnitramine, yet is no more sensitive to shock than the pentaerythritol tetranitrate, etc., which is being detonated.

In carrying out this invention, it is important to utilize mixtures of lead azide and barium styphnate within the range of 1 part lead azide to 1 part barium styphnate to 1 part lead azide to 10 parts barium styphnate.

The following examples are given by way of illustration of the instant invention and are not limiting thereon. Parts and percentages expressed therein are by weight unless specifically designated to the contrary.

Example I

A mixture of one part lead azide to two parts barium styphnate was made of the two materials together. This mixture of lead azide and barium styphnate was subjected to a drop weight sensitivity test using type 12 drop hammer tooling. This test comprises dropping a 2 kilogram weight from predetermined heights of samples of the explosive and determining the weight at which detonation of the explosive occurs fifty percent of the

2

time. The mixture described above (which is the initiator of the instant invention) was detonated according to the above described test by the drop of the 2 kilogram weight from a height of 31 centimeters. Pentaerythritol by comparison is detonated fifty percent of the time when said 2 kilogram weight is dropped from a height of 17 centimeters. It will be noted from comparing these two figures that the mixture described above is considerably less shock sensitive than is pentaerythritol.

A column of the mixture described above was detonated adjacent to a column of pentaerythritol and this mixture was found to detonate the pentaerythritol.

Example II

A mixture of one part of lead azide to ten parts barium styphnate was made of the two materials together. This mixture of lead azide and barium styphnate was subjected to a drop weight sensitivity test using type 12 drop hammer tooling. This test comprises dropping a 2 kilogram weight from predetermined heights of samples of the explosive and determining the weight at which detonation of the explosive occurs fifty percent of the time. The mixture described above (which is the initiator of the instant invention) was detonated according to the above described test by the drop of the 2 kilogram weight from a height of 68 centimeters. Pentaerythritol by comparison is detonated fifty percent of the time when said 2 kilogram weight is dropped from a height of 17 centimeters. It will be noted from comparing these two figures that the mixture described above is considerably less shock sensitive than is pentaerythritol.

A column of the mixture described above was detonated adjacent to a column of pentaerythritol and this mixture was found to detonate the pentaerythritol.

It is to be understood that the foregoing detailed description is given merely by way of illustration and that many variations may be made therein without departing from the spirit of our invention.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. An insensitive explosively detonatable composition for igniting secondary explosives comprising between 1 part barium styphnate to 1 part lead azide and 10 parts barium styphnate to 1 part lead azide.

2. An initiator composition consisting of a mixture of between 1 part barium styphnate to 1 part lead azide and 10 parts barium styphnate to 1 part lead azide and a secondary explosive selected from the group consisting of pentaerythritol tetranitrate, tetramethylene tetranitramine, trimethylene trinitramine and trinitrophenylmethylnitramine.

References Cited by the Examiner

FOREIGN PATENTS

687,341 5/1964 Canada.
280,249 8/1928 Great Britain.

BENJAMIN R. PADGETT, *Acting Primary Examiner*.
LEON D. RODSOL, *Examiner*.
L. A. SEBASTIAN, *Assistant Examiner*.