METHOD OF PRODUCING EXPLOSIVE WITH
HIGH BRISANCE
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ABSTRACT OF THE DISCLOSURE
This invention relates to a method of producing an
explosive that has a high brisance. In order to increase
the specific gravity of high explosives without the neces-
sity of compression, one or more types of water soluble
substances, such as sugar, glycine, sodium chromate and
the like are dissolved in water and a saturated solution is
obtained.

By dissolving one or more types of natural or synthetic
water-dispersible polymers such as starch, for example
powdered potato starch derived from the konnyaku potato,
carboxymethylcellulose and the like, in this solution, a
non-evaporative and non-crystallizing binder with a mini-

mum specific gravity of 1.45 is obtained.

By employing this binder and adding an appropriate
amount to one type or a mixture of two or more types of
high explosives and mixing, a specific gravity of 1.45 and
over can be readily produced without compressing.

BACKGROUND OF THE INVENTION

Therefore high brisance and safety in handling were
desired features of explosives. The brisance of an exp-
losive has the greatest influence on its detonation velocity.

Also the detonation velocity is proportionate to the ex-

plosive's density. Therefore, for military explosives and high
velocity explosives requiring high brisance a high density
becomes necessary and such methods as, compressing or
melting of the powder, or mixing with wax or plastic which
is then compressed and hardened, are employed. However
in either process heating and high compaction (400
kg./cm.²-700 kg./cm.²) becomes necessary resulting in
danger of accidental explosion, and complicating the
process.

SUMMARY OF THE INVENTION

The explosives of the present invention can attain a
high density (1.5 g./cm.³ and over) without being subjected
to these heating and compression steps.

Therefore it has been experimentally known that when
an appropriate amount of liquid is contained within an
explosive its detonation velocity is increased. However in
actual usage there has been no example wherein this
principle has been employed with an objective of heighten-
ing the brisance of a high explosive, except for cases
where a small amount of water has been added to mining
and industrial explosives to attain safety.

DESCRIPTION OF THE PREFERRED
EMBODIMENT

Under this invention in order to heighten the explosion
brisance of a single type or a mixture of 2 or more types of
high explosives, such as cyclotronitrile for tri-lithium
(hereinafter called RDX), pentaerythritol tetranitrate
(hereinafter called PETN), trinitrophenylmethyl nitra-
mine (hereinafter called tetryl), and trinitrotoleune (here-
inafter called TNT) a saturated solution is prepared by
dissolving a water soluble inorganic salt such as sodium
chromate, sodium sulphate, sodium nitrate, sodium per-
chlorate, lithium chromate or ammonium nitrate or one
or more types of water soluble organic substances such as
sugar or glycine in water, and in this saturated solution
2-5% of one or more types of natural or synthetic gums
such as starch or carboxymethyl cellulose is dissolved.

The resulting product is a gel-like material which is
non-evaporative and non-crystallizing and has a specific
gravity of 1.45 or more. By employing this as a binder
and adding an appropriate amount (e.g., 10-30%) to an
explosive and mixing at normal temperature a plastic ex-

plosive is obtained. In other words this is a method of
manufacturing an explosive which will readily attain a high
density of 1.50 and over without compression thus en-
abling the generation of high brisance quite readily.

Example
To 100 milliliters of water 200 grams of sodium nitrate
and 10 grams of sugar are added, and by further dissolv-
ing 5 grams of potato starch powder derived from the
konnyaku potato, in this solution a gel-like, high viscos-
ity, non-evaporative, non-crystallizing binder is obtained.

By adding 20% by weight of this binder to a high ex-

plosive such as RDX, PETN, tetryl, TNT, or the like, and
mixing, an explosive of plastic nature of a high specific
gravity is obtained.

CAPACITY TABLE

<table>
<thead>
<tr>
<th>Name of explosives</th>
<th>Binder, percent</th>
<th>Specific gravity (g/cm³)</th>
<th>Detonation velocity (cm/sec)</th>
<th>Explosion charge diameter (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RDX</td>
<td>20</td>
<td>1.67-1.70</td>
<td>8,500-8,700</td>
<td>10</td>
</tr>
<tr>
<td>Tetryl</td>
<td>10</td>
<td>1.69-1.80</td>
<td>7,600-8,800</td>
<td>10</td>
</tr>
<tr>
<td>TNT(D)</td>
<td>20</td>
<td>1.30</td>
<td>7,800</td>
<td>10</td>
</tr>
<tr>
<td>PETN</td>
<td>20</td>
<td>1.64</td>
<td>8,600</td>
<td>10</td>
</tr>
</tbody>
</table>

I claim:
1. A method of producing an explosive composition
that is capable of generating high brisance, comprising
the steps of preparing a substantially saturated solution of at
least one water-soluble substance of the class consisting
of water-soluble inorganic oxidizer salts, sugar and glycine,
incorporating in said solution at least one water-dis-
persible polymer of the class consisting of starch and
carboxymethyl cellulose, in an amount sufficient to pro-
duce a non-evaporative, non-crystallizing binder having a
specific gravity of at least 1.45; and then mixing, without
compressing, at least one organic explosive of the class
consisting of cyclotronitrile for trinitrophenyl, pentaeryth-
ritol tetranitrate, trinitrophenyl ethyl nitramine, and tri-
nitrotoleune with said binder, said binder comprising 10
to 30% by weight of said organic explosive.

References Cited
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