

## Evaluation of Crystal Properties and Initiation Characteristics of Decreased Sensitivity RDX

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**Abstract:** The crystal characteristics of decreased sensitivity RDX (D-RDX) and commercial RDX (RDX) were studied by optical microscopy with matching refractive index, scan electron microscopy (SEM), sink-float process and laser particles apparatus. It is found that there was obvious difference of crystal characteristics such as microstructure of inter crystalline voids, particle size and distribution, shape, morphology between D-RDX and commercial RDX. The crystal characteristics value of D-RDX were measured: average particle size being 283 μm, the span of size distribution being 0.8, spherical degree being 0.85, smooth particle surface, explosive particles apparent density being above 1.798 g · cm<sup>-3</sup>. The shock wave sensitivities of D-RDX and commercial RDX were measured using small scale-gap test, from which the decrease level of the shock wave sensitivity of D-RDX melted with TNT is 10% -15% and casted with HTPB is 31.4%. The difference of shock wave sensitivity of melted or casted explosive charge relates closely to the crystal characteristics of RDX.

**Key words:** physical chemistry; RDX; crystal characteristics; shock sensitivity

**CLC number:** TJ55; TQ564

**Document code:** A

**DOI:** 10.3969/j.issn.1006-9941.2011.06.006



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## 向作者致谢

近年,《含能材料》得到了广大作者的大力支持,为表达我们深深的谢意,特向2010~2011两年来发表两篇以上论文的作者(第一作者)赠送2012年全年《含能材料》。本刊期望在新的一年里能继续得到广大作者更多的关心! 欢迎赐稿!

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二〇一一年十二月