

^{136}Gd

In 2026, Suzuki et al. discovered ^{136}Gd in “Discovery of proton-rich radioactive isotopes in the $Z = 63\text{-}70$ region produced by the projectile fragmentation of a 345-MeV/nucleon ^{238}U beam” (2026Su06). The RIKEN RI factory delivered the ^{238}U beam to a 1 mm thick beryllium target. The large-acceptance two-stage separator Big-RIPS was used to separate the fragments. A thin tantalum foil at the first dispersive focus reduced the fraction of less-exotic contaminants. The fragments were identified with the TOF– $B\rho - \Delta E$ method. “In total, 14 new isotopes were obtained with the ^{135}Tb and ^{146}Yb settings based on the evaluation shown in the NNDC as of October 2025: $^{132,133}_{63}\text{Eu}$, $^{133,134,136}_{64}\text{Gd}$, $^{136,137,138}_{65}\text{Tb}$, $^{138}_{66}\text{Dy}$, $^{143}_{67}\text{Ho}$, $^{143}_{68}\text{Er}$, $^{144}_{69}\text{Tm}$, and $^{147,148}_{70}\text{Yb}$.”

Previously, the identification of ^{136}Gd in the fragmentation reaction of a 30 MeV/nucleon ^{197}Au had only been reported in a conference proceedings (2000So11).

2000So11 G. A. Souliotis, Phys. Scr. T **88**, 153 (2000).

2026Su06 H. Suzuki, N. Fukuda, H. Takeda, Y. Shimizu *et al.*, Prog. Theor. Exp. Phys. **2026**, 023 (2026).

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