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Diamonds are Forever: Using NIR to Find the Fakes

Researchers used spectroscopy and time-gated near infrared luminescence to reveal cubic zirconia in batches of tiny diamonds.



In the mid-1950s, Ian Fleming met with Sir Percy Silcock, the ex-head of MI5, who was working in security for diamond-trading company De Beers. The meeting helped inspire the fourth James Bond Novel, *Diamonds Are Forever*. The book title came from a 1940s advertising campaign that over 30 years would launch an entire industry and establish "De Beers" as synonymous with diamonds. In the movie adaptation starring Sean Connery, James Bond tricks the villain by swapping real diamonds for fake.

Whether it's a thrilling escape, the heist of a century, or the secret hand-off of a small velvet bag with considerable heft, humanity has been enthralled and fascinated by diamonds and their legitimacy. We see it all the time in the movies: characters attempting to ascertain if their ill-gotten diamonds are legitimate, or just so much useless glass.

Ways to Spot a Fake

In real life, there are several well-practiced methods for testing a diamond's authenticity. For one, drop it in a glass of water. If it doesn't sink directly to the bottom, it's definitely not a diamond. Place a diamond under an ultraviolet light and note the reaction. If it emits a blue glow, it's likely a diamond. If you place it on a piece of newspaper and can read the letters

Diamonds are Forever: Using NIR to Find the Fakes

Cubic zirconia is easy and inexpensive to make and the diamond industry has long considered it an existential threat. Consider a diamond crusted band, what if some of those diamonds are actually cubic zirconia? Most people would never be able to tell, and even many retail jewelers wouldn't notice. De Beers helped pioneer a new, inexpensive method for testing these small stones, using near infrared and time-gated imaging to tell colorless cubic zirconia from the real deal.

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