

Aluminum Oxynitride: A general review



TRANSPARENT ARMORS



BULLET-PROOF GLASS



INFRARED DOMES



INTRODUCTION:

Aluminum Oxynitride often referred to as transparent aluminum with the chemical formula $[(\text{AlN})_x (\text{Al}_2\text{O}_3)_{1-x}]$ is a ceramic consisting mainly of aluminum, oxygen and nitrogen. Optically transparent (>80%) in near-ultraviolet, visible and infrared regions and having cubic spinel structure makes it the the hardest polycrystalline transparent ceramic available. Owing to its superior optical and mechanical properties, aluminum oxynitride has gained significant attention from researchers over the past decade.

PROPERTIES:

- Optically transparent in the near-ultraviolet, visible and infrared regions
- Best available material in terms of optical quality
- Corrosion resistant
- Resistance to damage from radiation and oxidation
- High flexural strength
- Excellent hardness (4X fused silica glass & 3X steel; of same thickness)
- Good compressive strength
- Bullet-proof

APPLICATIONS:

Due to its exceptional mechanical and optical properties, it is used in:

- Transparent armor
- Bullet-proof glass
- Blast-resistant windows
- Infrared-optical windows
- Sensor components
- Specialty IR domes
- Windows for laser communications and some semiconductor-related applications

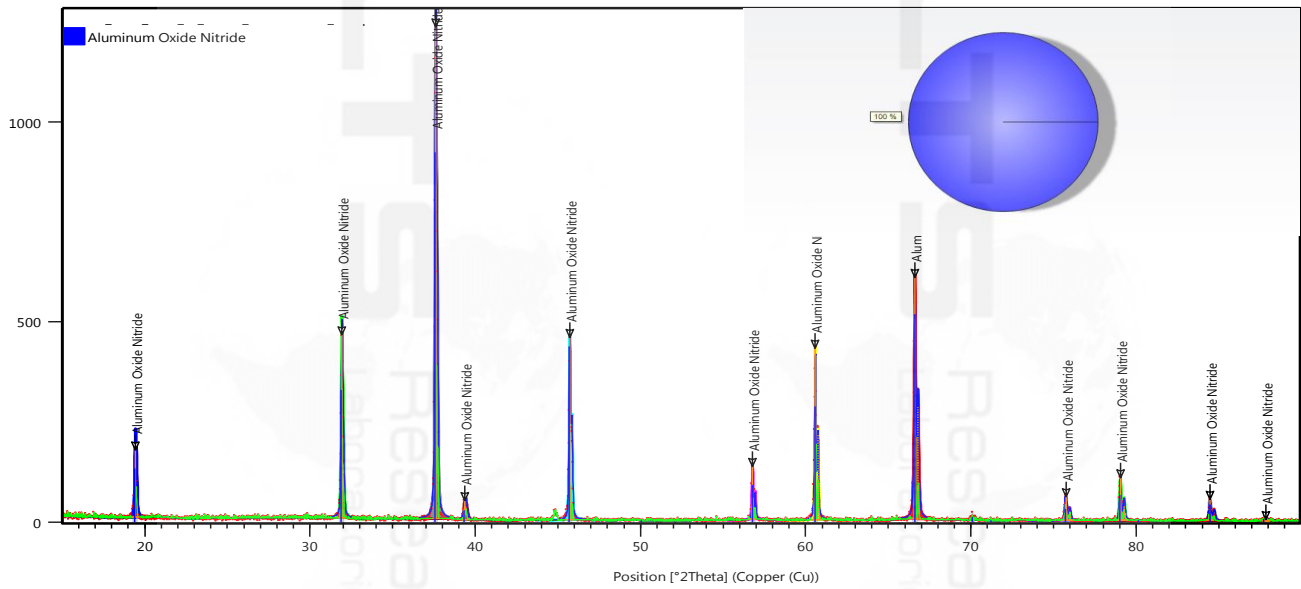


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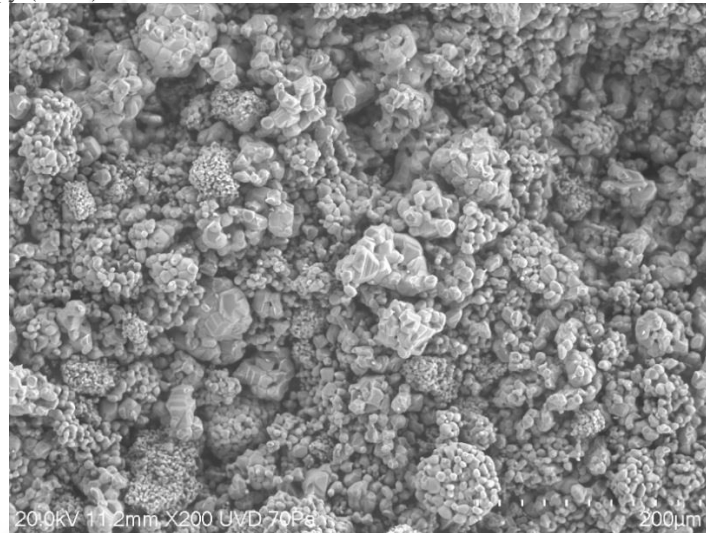
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The following characterization results reflect on the aluminum oxynitride offered by LTS Research Laboratories Inc.

X-Ray Diffraction (XRD)



Scanning Electron Microscopy (SEM):



Energy Dispersive Spectroscopy (EDS):

