Researchers at the University of South Florida have proposed a method for the detection of primary constituents of Improvised Explosive Device (IED).

IEDs are increasingly being used by terrorists and commando or guerilla forces in unconventional warfare. IEDs also known as booby traps or roadside bombs are designed from military explosive and or chemical, biological or radiological materials to cause maximum death and injury. About 80% of US and 50% of Afghanistan combat casualties are caused by IEDs. The ingenious ways that IEDs are hidden make them difficult to spot behind signs, guardrails, carcass and under debris on roadsides.

Troops and civilian mortality have an undesirable strain on the society and therefore there is a need to develop a sensitive system to detect the main constituents of IEDs. Nitroaromatic, nitramine and nitrate ester compounds are the primary constituents of explosive devices. The US Army has employed several preventive measures to reduce IED damage including troop training, military vehicles with jamming devices, engineer patrols to clear heavily travelled routes of debris, and explosive ordinance disposal teams among others. However these measures have not stemmed IED death or injuries.

Our inventors propose a method for the detection of these compounds by developing thin-film transparent conductive composites (TCCs) sensors. The new device is flexible, transparent, robust, specific and provides a rate of detection that is better than the status quo.

**ADVANTAGES:**
- Adaptability and lower production costs of processing technique
- Increased flexibility
- Increased robustness
- Better transparency of material
- Increased specificity and improved rate of detection

**Fig. 1. Schematic of hybrid materials architecture**

Tech ID # 09A016 Patent #: **8,034,302**