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STATEMENT OF ORIGINALITY

1. A new method, so-called sol-gel auto combustion, for the synthesis of barium calcium zirconate titanate ceramics based on the concepts of reducing energy use and production of high-quality nano-sized powder is proposed in this thesis.
2. The improvement in physical and dielectric properties of barium calcium zirconate titanate based-ceramics by the addition of bismuth oxide powder is proposed in this thesis.
3. In order to improve the dielectric properties of barium calcium zirconate titanate based-ceramics, the addition of lead magnesium niobate titanate crystals is proposed in this thesis.
4. The microstructure design of the new composite material is proposed in this thesis and its properties are compared to those of commercial products in order to assess the possibility of its use in real applications.

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ข้อความแห่งการริเริ่ม

1. วิทยานิพนธ์นี้ได้นำเสนอวิธีการใหม่โดยเลือกวิธีใช้แลกอ้อโตคอมบัสชั่น เพื่อการสังเคราะห์ ผงแบบเรียมแคลเซียมเซอร์โโคเนต ไททาเนต บนพื้นฐานของความคิดเพื่อการลดพลังงานความร้อน และปรับปรุงคุณภาพสูงขึ้น
2. เพื่อการเพิ่มประสิทธิภาพของสมบัติทางกายภาพและสมบัติไดอิเล็กทริกในเชรามิกแบบเรียมแคลเซียมเซอร์โโคเนต ไททาเนต โดยการเติมผงบิสมัท ได้นำเสนอในงานวิจัยวิทยานิพนธ์นี้ เพื่อเพิ่มประสิทธิภาพของสมบัติไดอิเล็กทริกโดยการเติมผลึกแบบเรียมแคลเซียมเซอร์โโคเนต ไททาเนต โดยการเติมผลึกเคลดแมกนีเซียม ในไอบีด ไททาเนต ได้นำเสนอในวิทยานิพนธ์นี้ การออกแบบโครงสร้างจุลภาคของวัสดุชนิดใหม่ ได้นำเสนอในวิทยานิพนธ์นี้ และเปรียบเทียบวัสดุจากวิทยานิพนธ์นี้กับผลิตภัณฑ์ทางการค้าสำหรับแนวทางเพื่อเป็นประโยชน์ในการประยุกต์ใช้จริง

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