**1.项目名称：**

构建异质外延界面开发高性能纳米复合电子陶瓷及其元器件

**完成单位：**

宝鸡文理学院，西北大学，烽火诺信科技有限公司，大唐宝鸡热电厂

**完成人：**

胡登卫，崔斌，温普红，王艳，程花蕾，马蓉，窦树梅，王冬梅，任莉君、张改妮，赵薇薇，赵艳，赵凡，高蕾等

**项目简介：**

以层状金属氧化物为前驱体，基于原位拓扑化学转换机制，运用溶剂热软化学工艺，采用旋转涂布、异质外延生长和反应模板颗粒生长等方式，综合使用取向工程、电筹工程和应变工程等先进技术，人工构建高密度异质外延界面，开发新型高性能电子陶瓷和电子元器件。开发机制复杂但工艺相对简单，投资成本较低，产品环境友好、性能优异、应用广泛，商业前景广阔。合作成功制作的光电转换器件、压电发电传感器件、阵列传感器、铁氧体磁环、表面波阵列天线等应用到宝鸡烽火诺信科技有限公司、大唐宝鸡热电厂、宝鸡健盛全电子科技有限公司、深圳市坤邑紫垣科技有限公司，促进该企业产值大幅提升，部分产品打破了国外垄断的局面，为区域经济发展做出了贡献。

**主要知识产权目录：**

1. **科研项目**
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3. 国家自然科学青年基金项目，21501007，芯-壳结构超高温多层陶瓷电容器介质材料的制备与性能调控，20150101-20171231，23.8万元，在研。
4. 陕西省科技厅工业攻关项目，新型织构化无铅压电陶瓷材料的开发及性能研究，20160101-20181231，10万元，在研。
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47. ZL201620222113.0 取向性碱土金属钛酸盐压电复合薄膜 2016.09.14
48. ZL201620222284.3 一种具有钙钛矿结构的多层无铅压电复合陶瓷器件 2016.08.17
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50. ZL201620408622.2 一种组合片式陶瓷外壳压电元件 2016.09.28
51. ZL201620399257.3 一种压电片组装式压电管 2016.09.28

**2.项目名称：**关中西部矿区周边土壤重金属污染测定及优势植物筛选研究

**完成单位：**宝鸡文理学院

**完成人：**徐玉霞、王华斌、汪庆华、薛雷、彭囿凯

**项目简介：**

本项目选取宝鸡市的凤翔铅锌冶炼区、麟游县的北马坊煤矿、郭家河煤矿和北王煤矿为研究区域，对其周边的农田土壤进行野外采样和室内分析，测定Zn、Cr、Pb、Cu、Cd、Hg、As 7种重金属的污染状况。结果表明：测定的7种重金属元素的最大值均超过了陕西省土壤背景值和当地的土壤环境背景值。单因子污染指数评价得出，矿区周边的土壤、Pb、Zn和Hg元素的污染较严重，局部地区已经达到了重度污染；综合污染指数法评价得出，矿区均达到了中度到重度污染水平，其中凤翔的铅锌冶炼区和北王煤矿污染水平较高；地质累积指数法评价得出，研究区Pb、Zn和Hg元素的累积程度属于中度污染到强污染等级，Cd元素次之。因此研究区周边的耕地土壤已不同程度的受到重金属的污染，相关部门应该采取一定的措施治理该区的土壤。

**主要知识产权目录：**

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