THE HONG KONG POLYTECHNIC UNIVERSITY
香港理工大學

用於纖維素織物的新型硼基聚合物阻燃劑
Boron Polymer Flame Retardants for Cellulose Textiles

能夠有效減少室內織物釋出有毒煙霧的安全阻燃物料
Safer flame retardants that reduces smoke release from in-room textiles

在火災發生時，易燃紡織品往往對人身安全構成巨大的威脅。目前應用於紡織品的磷氮阻燃劑會在火中產生大量致命的有毒煙霧，這些煙霧和阻燃劑甚至會在環境中累積，並打破水體的生態平衡，促使藻類大量繁衍，導致魚類死亡。因此，我們研發了含硼基聚合物的新型阻燃劑，並以低溫浸軋整理方法把它加添到纖維素紡織品上。新型阻燃劑較傳統阻燃劑耐水洗，具有持久的阻燃及抑煙功效，能在燃燒時減少約80%有毒煙霧。

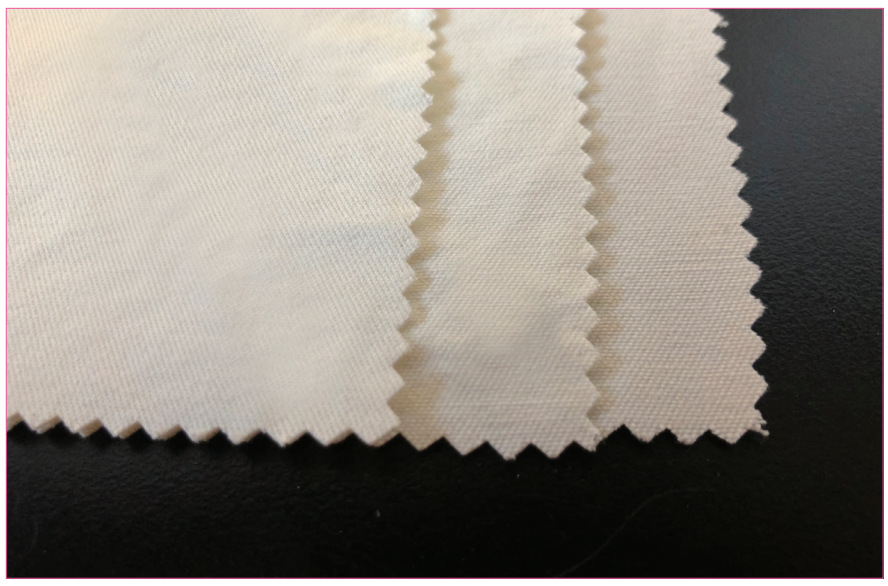
專利申請編號: CN201710063336.6 (中國)

特色與優點

- 以含硼氮的聚合物作阻燃劑
- 在纖維素織物上體現耐久的阻燃和抑煙效果

應　用

- 適用於各種纖維的紡織品，包括聚酯及纖維素基織物
- 處理過的織物適用於家居紡織品（如窗簾及床上用品）、裝飾性織物及工作服等產品



含硼基聚合物的新型阻燃劑的纖維素紡織品
Cellulose fabrics with boron polymer flame retardants

	Cotton without FR	PolyU B-FR cotton	Commercial FR cotton-P
Time to ignition (s)	9	8	7
Peak of heat release rate (kW / m²)	257.6	159.1	59.16
Total heat release (MJ / m²)	3.3	2.1	2.5
Total smoke release (m² / m²)	2.6	**29.6**	**145.8**
Average carbon monoxide yield (kg/kg)	0.0477	**0.0018**	**0.0026**
Average carbon dioxide yield (kg/kg)	1.80	0.045	0.038

與傳統阻燃劑相比，在燃燒時，理大的硼基聚合物阻燃劑減少約80%有毒煙霧及31% 一氧化碳的產生
Compared with commercial flame retarder, PolyU's boron polymer flame retardant reduces 80% smoke and 31% carbon monoxide release in fire

Flammable textiles pose a significant threat to human lives during a fire. Existing phosphorus flame retardants (FR) for textiles generally release large amounts of deadly smoke in fire. Such smoke and phosphorus FRs may accumulate in the environment and disrupt the balance of aquatic ecosystem, resulting in algae blooms and fish kills. Consequently, we developed boron polymers flame retardants. It is applied on cellulose fabrics by padding and low temperature curing. Compared with conventional FRs, it is more washable, durable and efficient in flame and smoke inhibition, greatly reducing smoke release in fire by 80%.

Patent Application No.: CN201710063336.6(China)

Special Features and Advantages

- Uses boron and nitrogen organic compounds as FRs
- Demonstrates durable effects in retarding flame and inhibiting smoke on cellulose fabrics

Applications

- Applicable to textiles made of different fibres, such as PET and cellulosic fibres
- Treated textiles are suitable for making products like home textiles (e.g. curtains, bedding), decorative textiles and uniforms

Access More info via mobile
Note: Subject to data charges by mobile operators

Principal Investigator
Dr Bin FEI
Institute of Textiles and Clothing
Contact Details
Institute for Entrepreneurship
Tel: (852) 3400 2929 Fax: (852) 2333 2410 Email: pdadmin@polyu.edu.hk

5_ITC_40_1019