P-FKP10: Poly(tetraarylindenofluorene)s: A Novel Promising Polymer for Stable Blue Light Emitting Devices

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In the last decade, highly luminescent conjugated polymers became very attractive as the active materials in polymer light emitting diodes (PLED)s and polymer laser applications. One area of major ongoing effort in academic and industrial research is the development of materials, which show efficient stable blue light emission. For this purpose blue light emitting polymers such as polyfluorenes (PF)s, polyindenofluorenes (PIF)s and ladder-type poly-para-phenylenes (LPPP)s have been investigated. We demonstrate that the issue of the unwanted long wavelength emission from ketonic defects as found in PF type polymers can be overcome in polyindenofluorenes. It is shown that by the introduction of aryl substituents the polymer is less susceptible to oxidation. Therefore, a new polyindenofluorene with octylphenyl side-chains has been prepared via a terphenyl intermediate. Organic light emitting devices fabricated with this new polyindenofluorene display stable blue emission. In particular we present the new indenofluorene-based polymer with aryl substituents on the methine bridges, prepared in high yields by a short, efficient synthetic route and show results from differently prepared PLEDs fabricated using the new polymer. Such devices show stable emission at voltages below 10 V, with brightnesses of up to 125 cd/m² and efficiencies of up to 0.11 cd/A. In addition, no emission from ketonic defects was detected even in devices run under high stress conditions.

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