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(54) **EFFICIENT ROOM-TEMPERATURE SOURCE OF POLARIZED SINGLE PHOTONS**

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See application file for complete search history.

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(57) **ABSTRACT**

An efficient technique for producing deterministically polarized single photons uses liquid-crystal hosts of either monomeric or oligomeric/polymeric form to preferentially align the single emitters for maximum excitation efficiency. Deterministic molecular alignment also provides deterministically polarized output photons; using planar-aligned cholesteric liquid crystal hosts as 1-D photonic-band-gap microcavities tunable to the emitter fluorescence band to increase source efficiency, using liquid crystal technology to prevent emitter bleaching. Emitters comprise soluble dyes, inorganic nanocrystals or trivalent rare-earth chelates.

128 Claims, 6 Drawing Sheets

