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Deen Gu, Xin Zhou, Rui Guo, Zhihui Wang, Yadong Jiang

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Deen Gu*, Xin Zhou, Rui Guo, Zhihui Wang, Yadong Jiang

School of Optoelectronic Information, University of Electronic Science and Technology of China, 610054 Chengdu, Sichuan, People's Republic of China

ABSTRACT:

One of promising approaches for further improving the sensitivity of microbolometer arrays with greatly-reduced pixel size is using the thermal-sensitive materials with higher performance. In this paper, Y-doped vanadium oxide (VO_x) thin films prepared by a reactively sputtering process exhibit enhanced performance for the microbolometer application compared with frequently-applied VO_x thin films. Both undoped and Y-doped VO_x thin films are amorphous due to the relatively low deposition temperature. Y-doped VO_x thin films exhibit smoother surface morphology than VO_x due to the restrained expansion of particles during depositions. Y-doping increases the temperature coefficient of resistivity by over 20 % for the doping level of 1.30 at%. The change rate of resistivity, after aging for 72 hours, of thin films was reduced from about 15 % for undoped VO_x to 2 % due to the introduction of Y. Moreover, Y-doped VO_x thin films have a low 1/f noise level as VO_x ones. Y-doping provides an attractive approach for preparing VO_x thermal-sensitive materials with

* Corresponding author. Tel: +86 28 83206505; fax: +86 28 83206123.
E-mail address: gudeen@163.com (Deen Gu).