

紫外分光光度法测定中草药注射液中

吐温-80临界胶束浓度

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摘要 含有不同浓度吐温-80的中草药注射液,在一定的波长下用紫外分光光度计测其相应的吸收度。由吸收度-表面活性剂物质的对数关系曲线的突变点,得知药液中吐温-80的临界胶束浓度(CMC)。为中草药注射液中吐温-80的最佳用量,提供定量的参考标准。

关键词 中草药注射液 吐温-80 紫外分光光度法 临界胶束浓度

吐温-80为非离子型表面活性剂。中草药注射液生产工艺过程常用作增溶剂,以改善药液的澄明度和稳定性^[1]。根据物化有关理论,吐温-80在药液中的含量达到其临界胶束浓度(CMC),便可起到增溶剂的作用^[2]。为此,我们采用紫外分光光度法测定了板蓝根、补骨脂、鱼腥草、柴胡等中草药注射液中吐温-80的CMC,效果良好,现介绍如下。

仪器与药品

GW-751型分光光度计(上海分析仪器厂),UV-265分光光度计(日本岛津)。吐温-80(日本进口 广州分装 批号911212),碘液,注射用水,自制板蓝根、鱼腥草、柴胡、补骨脂注射液^[3]。

2 方法与结果

2.1 测定波长和碘液浓度的确定:准确配制0.02%、0.04%、0.06%、0.08%、0.1%等一系列浓度不同的碘液,用UV-265分光光度计测定,各浓度的碘液在355nm和287nm处有吸收峰,尤其是在355nm处吸收峰明显。本着既要碘液发挥增敏作用,又要使其含量尽可能低的原则,故确定所用碘液浓度为0.02%。用一定量的0.02%碘液分别与含有吐温-80的中药注射液和纯的中药注射液混合,用UV-265分光光度计测定结果表明:加有吐温-80的板蓝根和补骨脂注射液在361nm处有最大吸收峰;鱼腥草和柴胡注射液则分别在359nm处及347nm处有最大吸收峰。而没有加吐温-80的碘和各纯药液的混合液在相应的波长下吸收度接近为零。故得以确定板蓝根、补骨脂注射液的测定波长为361nm;鱼腥草和柴胡注射液的测定波长分别为359nm和347nm。

2.2 样品溶液的配制:取10ml容量瓶若干支,分别加入板蓝根和补骨脂注射液4ml、0.02%碘液0.4ml,再按容量瓶的编号依次加入不同量浓度的吐温-80水溶液4ml,用注射用水稀释至刻度便得样品溶液1、2;在另外的容量瓶中分别加入鱼腥草和柴胡注射液各1ml、碘液0.1ml、不同浓度的吐温-80溶液1ml,用注射用水稀释至刻度便得样品溶液3、4。

2.3 空白溶液的配制:分别精取与样品溶液1、2、3、4相同量的吐温-80和碘液,分置于10ml容量瓶中,用注射用水稀释至刻度便得相应的空白溶液。

2.4 测定与结果:在已确定的测定波长下,用GW-751分光光度计测定相应的空白溶液及样品溶液,记录测定数据。作吸收度-吐温-80%的对数关系图。图中曲线斜率的跃变点所

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避性条件反射顺序号数值加大,说明SFG能降低小鼠学习能力,延缓其完成学习的过程,延迟巩固性条件反射的建立。关于雪莲及其有效成分对中枢神经系统作用的研究尚未见报道,其作用机制需待进一步研究。

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对应的吐温-80%值即为其CMC^[4]。结果表明,板蓝根、补骨脂、鱼腥草、柴胡4种中药注射液中,吐温-80的CMC分别为: 0.42%、0.61%、0.075%、0.04%,以板蓝根和柴胡为例图示如图。

3 结果讨论

3.1 紫外分光光度法用于中草药注射液中吐温-80的CMC测定,灵敏度高,数据准确,样品用量少,适用范围宽。无论是煎煮法还是水蒸汽蒸馏法制备的中草药注射液均可应用。

3.2 不同的药液需用不同的测定波长,这是本法的关键。由于吐温-80为非离子型表面活性剂,用吸收光谱测其CMC时颜色变化不如其在离子型表面活性溶液中明显,故需用微量的碘液,以提高在紫外区适宜波长下观察光谱吸收变化的灵敏度^[5]。

3.3 吐温-80的粘度很大,为确保加入量精确,使用时用注射用水适当稀释。由于所用量很小故其对药液本身的浓度影响可忽略不计。

3.4 各中草药注射液中吐温-80用量达CMC,药液经灯检符合质量要求。中草药注射液大多成分复杂,为提高其稳定性和改善澄明度,所用吐温-80量必须要达到CMC,并可略大于CMC。

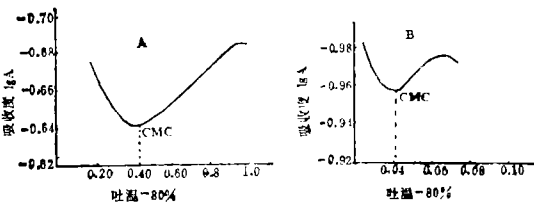


图 注射液吸收度-吐温-80对数图
A-板蓝根 B-柴胡

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ABSTRACTS OF ORIGINAL ARTICLES

Analysis of Oleanolic Acid with Laser Raman Spectroscopy

Wu Lianzhong, Ke Chuizhong, et al

Raman bands of oleanolic acid were measured with laser Raman spectroscopy, and compared with that obtained from IR spectroscopy. It was found that the corresponding characteristic bands of oleanolic acid can be identified in both spectroscopy.

(Original article on page 227)

Studies on the Alkaloids of Longtouwutou (*Aconitum longtounens*)

Chen Jianwen, Luo Shide

Four diterpenoid alkaloids were isolated from *Aconitum longtounens* T. L. Ming grown in Lijiang of Yunnan Province, for the first time. They were identified as foeseaconitine, chas-maconitine, desolone and descosine by physical constants and spectral data.

(Original article on page 228)

Studies on the Chemical Components of Common Leafy Flower

(*Phyllanthus urinaria*)

Li Ruisheng, Wang Sanyong, Zhang Weihua

10 crystalline compounds have been isolated from *Phyllanthus urinaria* Linn., Collected from Guangzhou. They were identified as triacontanol (II), stigmaterol (III), lup-20 (29)-ene-3 β -ol (IV), dotriacontanoic acid (V), succinic acid (VI) and β -stigmaterol-3-O- β -D-glucoside (VII). Their structures were elucidated on the basis of spectral data of IR MS, ^1H and ^{13}C NMR and other chemical methods. The other four are pending further identification.

(Original article on page 231)

Studies on the Preparation of Machixian Oral Liquid

Zhou Jing, Tian Guijie, Fu Jingwei, et al

Machixian Oral liquid was made from *Portulaca oleracea* L. Pharmacologic studies proved that it can obviously inhibit blood platelet aggregation and showed hypolipemia activity. A comprehensive investigation of the preparation was studied and a practical quality control was devised to ensure its therapeutic effect.

(Original article on page 239)

Determination of Tween-80 CMC in Chinese Herbal Medicine Injections by Ultraviolet Spectrophotometry

Chen Zhenjiang, Jiang Yue, Ye Wenzhen

Ultraviolet spectrophotometry was used to determine Tween-80 critical micell concentration (CMC) in different Chinese herbal medicine injections. Studies on the concentration of iodine solution and wavelength suitable for the determination were carried out. This method is quick and accurate and can be used for the quality control of such preparation.

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