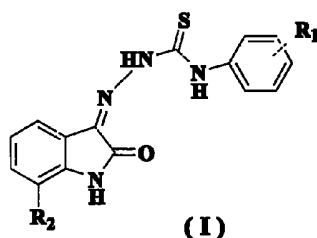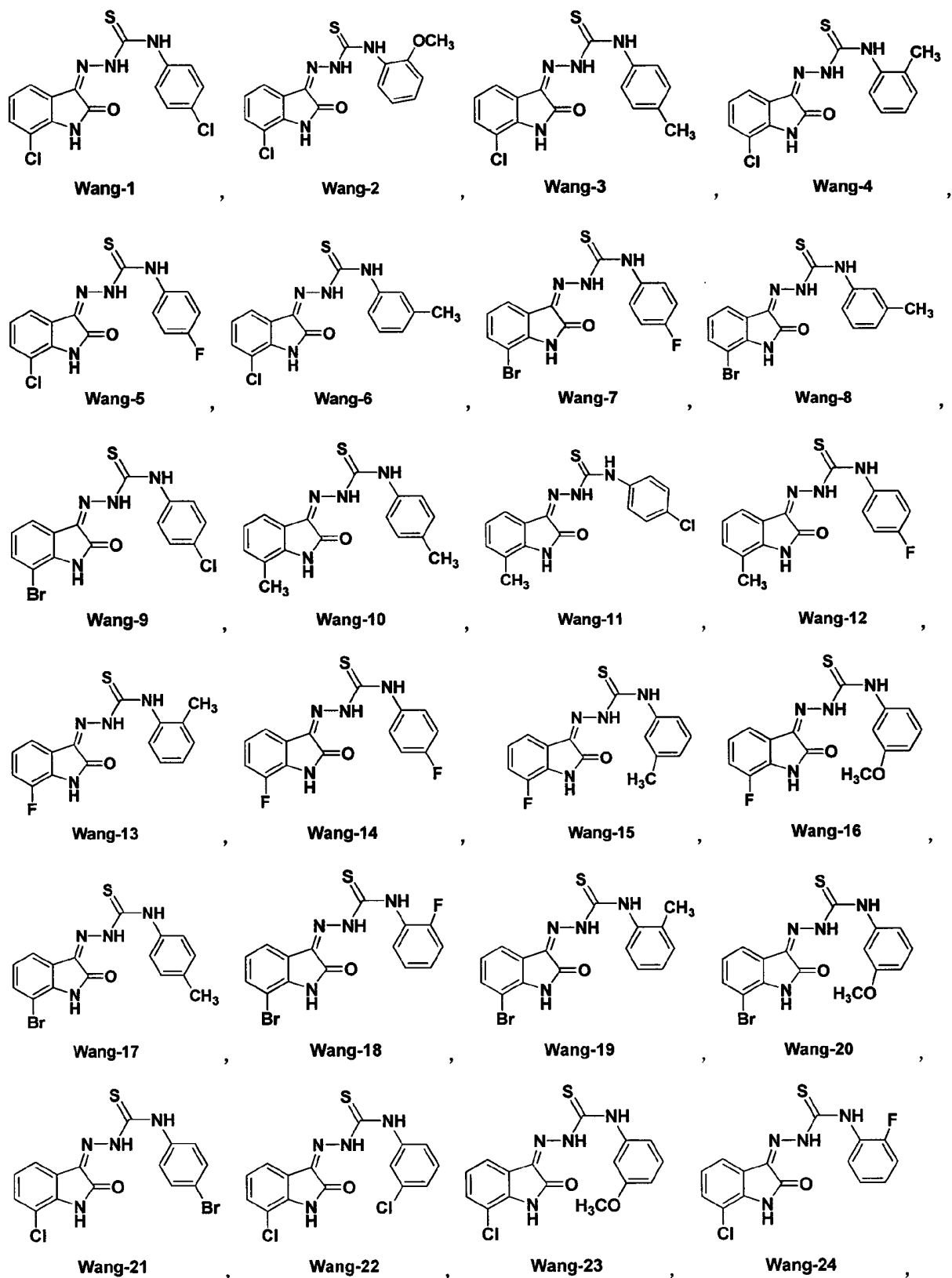(54) 发明名称

吲哚满二酮缩氨基硫脲类化合物及其抗耐药菌用途

(57) 摘要

本发明涉及吲哚满二酮缩氨基硫脲类化合物及其在制备抗耐药菌药物中的用途。本发明的吲哚满二酮缩氨基硫脲类化合物对耐甲氧西林金黄色葡萄球菌 (MRSA) 和耐万古霉素肠球菌 (VRE) 具有很强的抑制作用,可用于制备新型的有效抗耐药菌药物。该药物可以制成注射剂、片剂、丸剂、胶囊、悬浮剂或乳剂的形式使用。其给药途径可为口服、经皮,静脉或肌肉注射。所述的吲哚满二酮衍生物的化学结构式如式 (I) 所示,式中 R_1 为 o-CH$_3$、o-OCH$_3$、o-F、m-CH$_3$、m-OCH$_3$、m-F、m-Cl、p-CH$_3$、p-OCH$_3$、p-F、p-Cl、p-Br 或 H;R_2 为 CH$_3$、F、Cl、Br、I 或 H。

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1. 一种吲哚满二酮缩氨基硫脲类化合物,其特征在于该吲哚满二酮缩氨基硫脲类化合物为:

Wang-1 , Wang-2 , Wang-3 , Wang-4 ,

Wang-5 , Wang-6 , Wang-7 , Wang-8 ,

Wang-9 , Wang-10 , Wang-11 , Wang-12 ,

Wang-13 , Wang-14 , Wang-15 , Wang-16 ,

Wang-17 , Wang-18 , Wang-19 , Wang-20 ,

Wang-21 , Wang-22 , Wang-23 , Wang-24 ,

Wang-25 , Wang-26 , Wang-27 , Wang-28 ,

Wang-29 , Wang-30 , Wang-31 , Wang-32 ,

Wang-33 , Wang-34 , Wang-35 , Wang-36 ,

Wang-37 , Wang-38 , Wang-39 , Wang-40 ,

Wang-41 , Wang-42 , Wang-43 , Wang-44 ,

Wang-45 , Wang-46 和 Wang-47 。
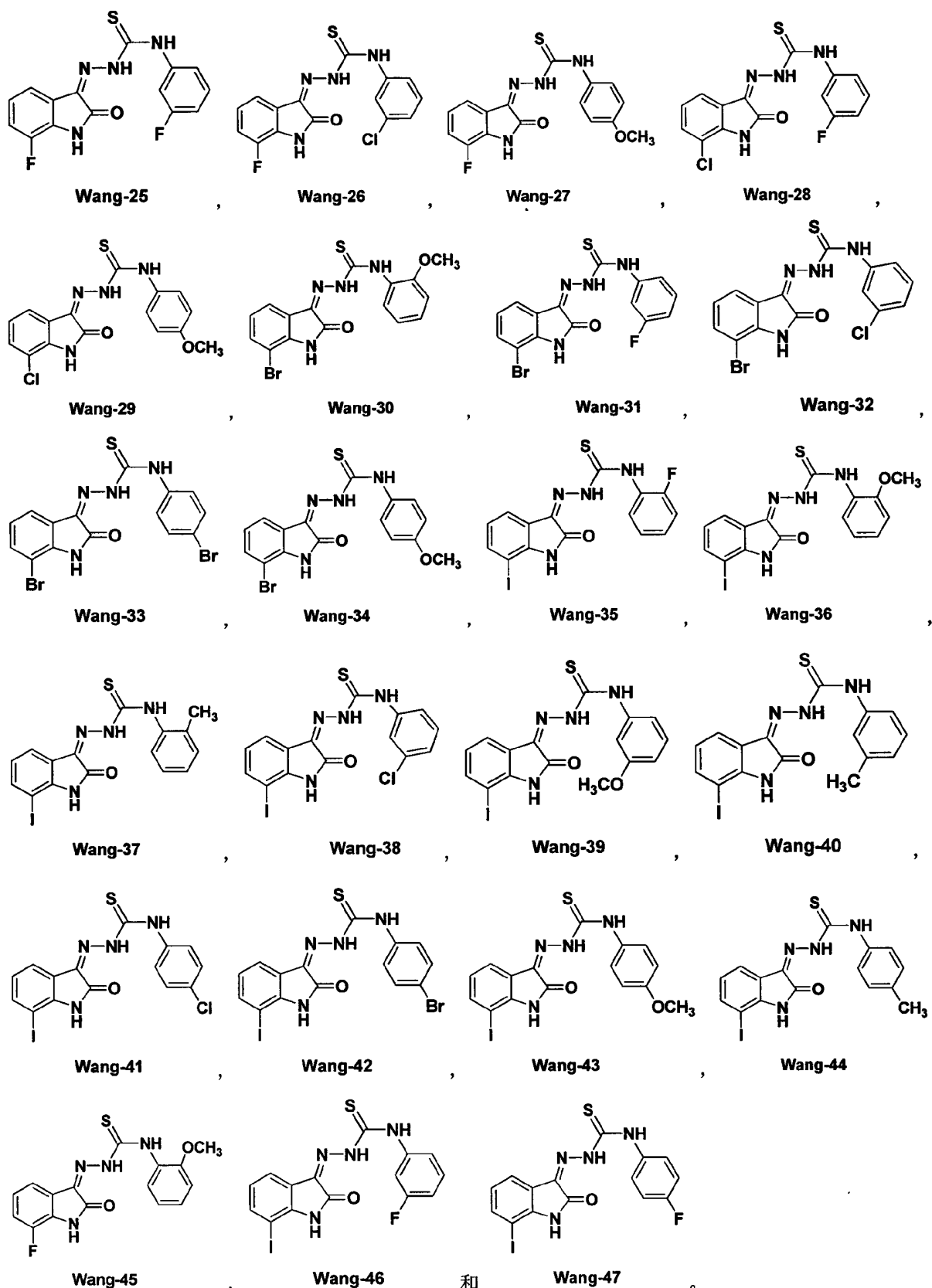
2. 权利要求 1 所述吲哚满二酮缩氨基硫脲类化合物作为制备抗金黄色葡萄球菌、抗耐甲氧西林金黄色葡萄球菌耐药菌 MRSA、抗耐万古霉素肠球菌 VRE 和抗枯草芽孢杆菌药物中的用途。

3. 一种抗菌药物，其特征在于它含有权利要求 1 所述的吲哚满二酮缩氨基硫脲类化合物以及一种或多种药学上可接受的载体 ;所述载体包括药学领域常规的稀释剂、赋形剂、填充剂、粘合剂、湿润剂、崩解剂、吸收促进剂、表面活性剂、吸附载体、润滑剂。

4. 根据权利要求 3 所述的抗菌药物，其特征在于它是含有所述抗菌药物的注射剂、片剂、丸剂、胶囊、悬浮剂或乳剂。

吲哚满二酮缩氨基硫脲类化合物及其抗耐药菌用途

技术领域

[0001] 本发明涉及吲哚满二酮缩氨基硫脲类化合物及其在制备抗耐药菌药物中的用途，特别是对耐甲氧西林金黄色葡萄球菌（methicillin-resistant Staphylococcus aureus，MRSA）和耐万古霉素肠球菌（vancomycin-resistant Enterococcus，VRE）等超级耐药细菌有很强的抑制效果。

背景技术

[0002] 抗生素是 20 世纪最伟大的发明，使得人类摆脱了病菌感染的致命威胁。然而，随着抗菌药物的广泛使用，由其引发的细菌耐药性目前已经成为不可忽视的医学难题。

[0003] 自 1961 年英科学家 Jevons MP 等人（Br.Med.J.1961,1,124-125）首次发现耐甲氧西林金黄色葡萄球菌（methicillin-resistant Staphylococcus aureus，MRSA）以来，MRSA 感染以惊人的速度在世界范围内蔓延，其致病性强，呈多重耐药，死亡率较高，成为名副其实的"超级细菌"。1988 年报道了对万古霉素有抗性的肠球菌（Vancomycin-resistant Enterococcus，VRE）也得已报道（Lancet,1988,1,57-58），进一步增加了细菌耐药的范围和程度；2010 年 9 月，Walsh TR 等人（Lancet Infect Dis.2010,10(9),597-602）报道了一种含有 NDM-1 酶的新型超级细菌，对几乎所有的抗生素都不敏感，引起了世界范围的广泛不安和高度关注。

[0004] 现在对超级细菌真正起效的抗生素种类已为数不多，临床上仅有万古霉素（vancomysin）、达托霉素（daptomycin）、利奈唑胺（linezolid）、替加环素（tigecycline）和头孢吡普（ceftobiprole）等药物。缺乏中国自主知识产权的药物品种，研究开发化学结构新颖的新型抗生素成为刻不容缓的历史使命。

[0005] 本研究团队在前期的研究中曾经发现某些吲哚满二酮缩氨基硫脲类化合物具有抗 MRSA 活性（王建国，张立新等，ZL201010534629.6），其中如下化合物

[0006]
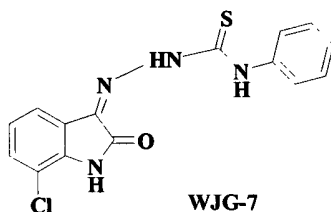
[0007] 在系列化合物中活性最好，其对所测试 MRSA 的最小抑制浓度为 0.78μg/mL。

[0008] 为了深入研究该类化合物的结构－活性关系，发现更高活性化合物，本发明进一步设计合成了一批新的吲哚满二酮缩氨基硫脲类化合物，其中多数化合物表现出极为理想的生物活性。

发明内容

[0009] 本发明的目的在于提供一种新的吲哚满二酮缩氨基硫脲类化合物及其在制备抗

耐药菌药物中的用途,特别是抗耐甲氧西林金黄色葡萄球菌 (MRSA) 药物和耐万古霉素肠球菌 (Vancomycin-resistant Enterococcus,VRE) 中的应用。

[0010]　　本发明的吲哚满二酮缩氨基硫脲类化合物如下式 (I) 所示 :

[0011]

(I)
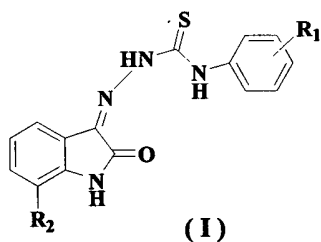
[0012]　　其中 R_1 为 o–CH_3、o–OCH_3、o–F、m–CH_3、m–OCH_3、m–F、m–Cl、p–CH_3、p–OCH_3、p–F、p–Cl、p–Br 或 H ;R_2 为 CH_3、F、Cl、Br、I 或 H。

[0013]　　具体的,本发明的吲哚满二酮缩氨基硫脲类化合物为 :

[0014]

Wang-1　　　,　　　Wang-2　　　,　　　Wang-3　　　,　　　Wang-4　　　,

Wang-5　　　,　　　Wang-6　　　,　　　Wang-7　　　,　　　Wang-8　　　,

Wang-9　　　,　　　Wang-10　　　,　　　Wang-11　　　,　　　Wang-12　　　,

Wang-13　　　,　　　Wang-14　　　,　　　Wang-15　　　,　　　Wang-16　　　,

[0015]

Wang-17 ,

Wang-18 ,

Wang-19 ,

Wang-20 ,

Wang-21 ,

Wang-22 ,

Wang-23 ,

Wang-24 ,

Wang-25 ,

Wang-26 ,

Wang-27 ,

Wang-28 ,

Wang-29 ,

Wang-30 ,

Wang-31 ,

Wang-32 ,

Wang-33 ,

Wang-34 ,

Wang-35 ,

Wang-36 ,

Wang-37 ,

Wang-38 ,

Wang-39 ,

Wang-40 ,

[0016]

Wang-41 ， Wang-42 ， Wang-43 ， Wang-44 ，

Wang-45 ， Wang-46 和 Wang-47 。
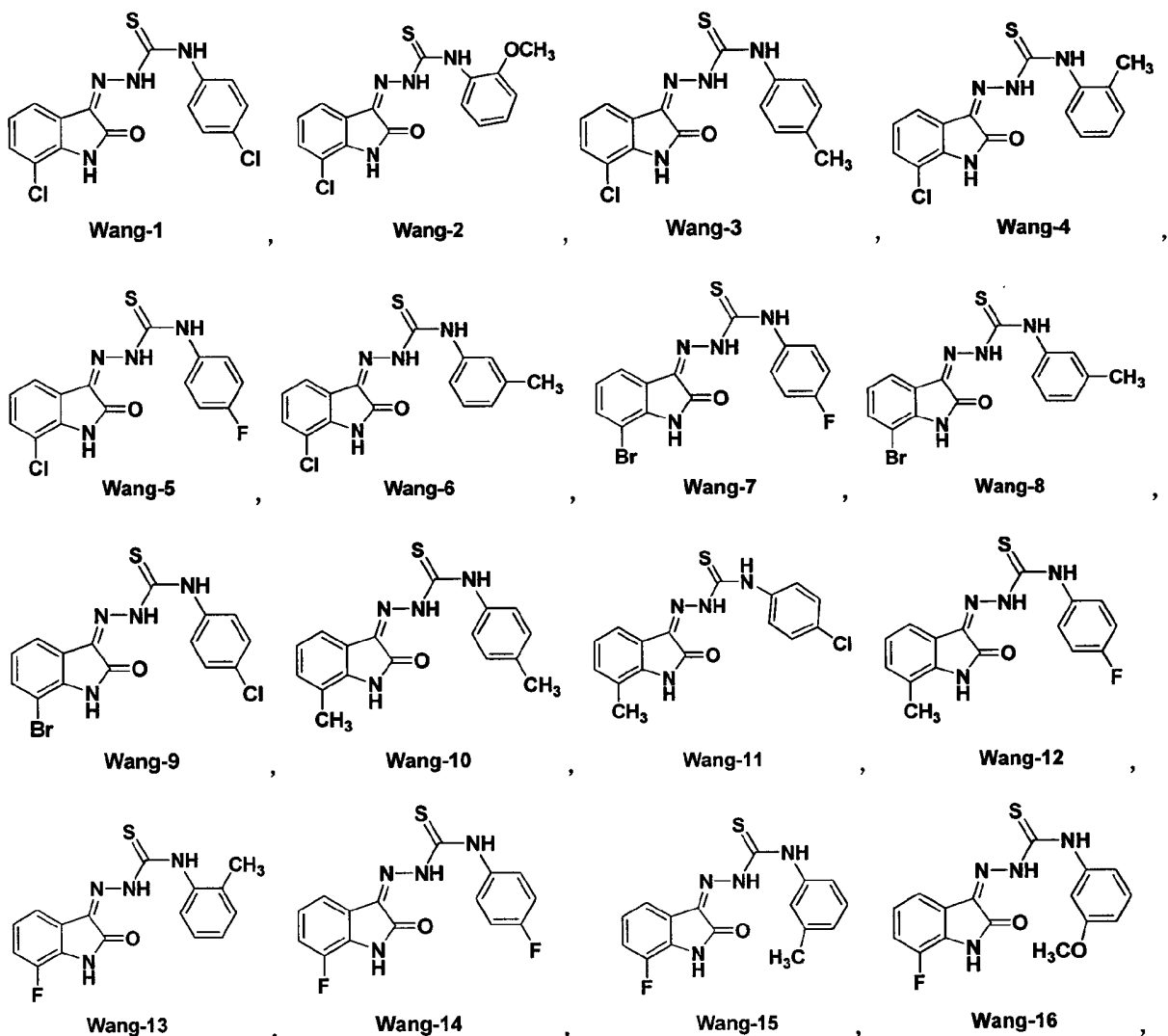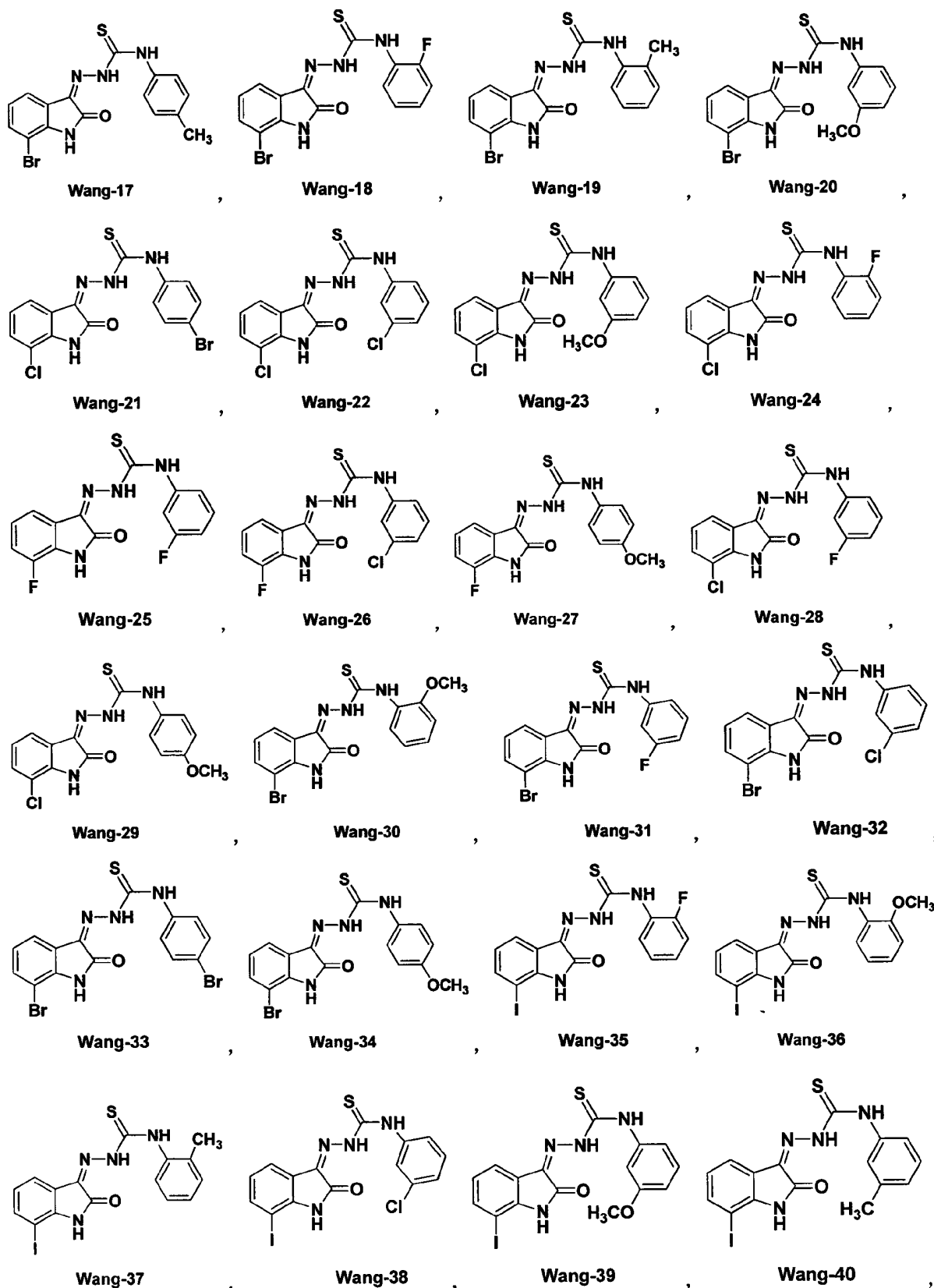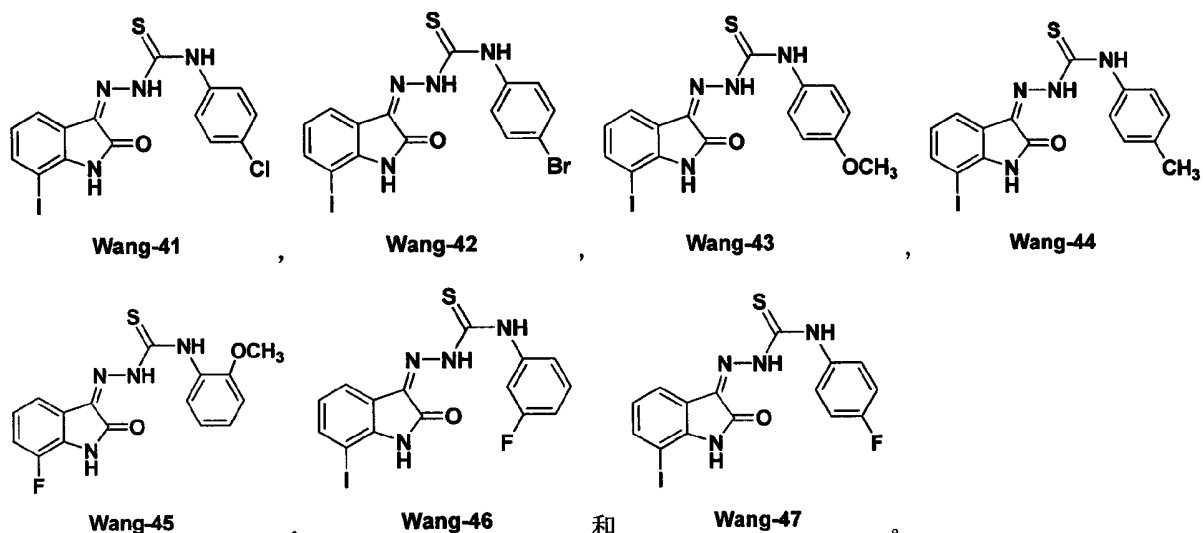
[0017] 本发明的吲哚满二酮缩氨基硫脲类化合物是通过以下反应通式获得：

[0018]

II + III → I
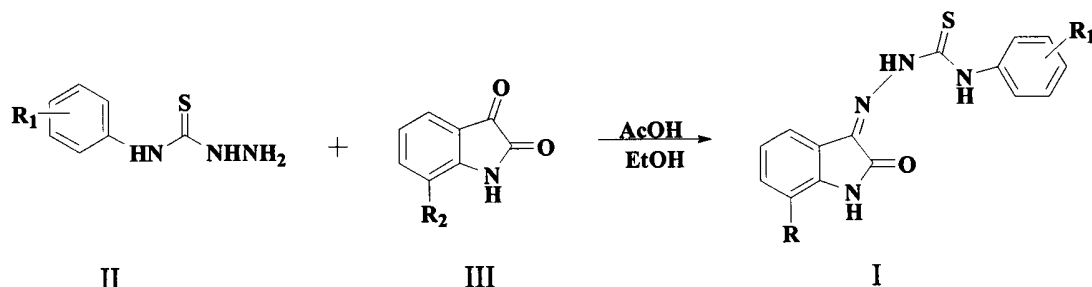
[0019] 将等摩尔当量的取代苯基氨硫脲 II 和取代吲哚满二酮 III 在乙酸中混合，在乙醇－水（5:1）溶液中回流 6h，然后冷却至室温，经过重结晶得到目标化合物 I。

[0020] 通过体外抑菌实验表明，本发明的吲哚满二酮缩氨基硫脲类化合物对耐甲氧西林金黄色葡萄球菌 (MRSA) 和耐万古霉素肠球菌 (VRE) 具有很强的抑制作用，多数化合物与对照药物万古霉素的药效相当或优于万古霉素，因此本发明的吲哚满二酮缩氨基硫脲类化合物可用于制备治疗抗耐甲氧西林金黄色葡萄球菌 (MRSA) 感染和耐万古霉素肠球菌 (VRE) 感染的活性化合物。

[0021] 本发明还提供一种用于治疗耐药菌感染的药物，特别是治疗抗耐甲氧西林金黄色葡萄球菌 (MRSA) 感染和耐万古霉素肠球菌 (VRE) 感染的药物；该药物含有上述的吲哚满二酮缩氨基硫脲类化合物以及一种或多种药学上可接受的载体。所述载体包括药学领域常规的稀释剂、赋形剂、填充剂、粘合剂、湿润剂、崩解剂、吸收促进剂、表面活性剂、吸附载体、润滑剂。该药物可以制成注射剂、片剂、丸剂、胶囊、悬浮剂或乳剂的形式使用。其给药途径可为口服、经皮，静脉或肌肉注射。

[0022] 本发明实质性特点可以从下述实施例中得以体现，但这些实施例仅作为说明，而不是对本发明进行限制。

具体实施方式

[0023] 下面对本发明的各个方面和特点作进一步的描述。

[0024] 本发明使用的各种术语和短语具有本领域技术人员公知的一般含义，特别提及的

8

术语和短语如有与公知含义不一致的,以本发明所表述的含义为准。本文所用的缩略语通常为本领域技术人员所熟知的,或者可以是根据基础知识易于理解的。

[0025]　　本发明使用的取代吲哚满二酮和取代苯基氨硫脲购自 Alfa Aesar(天津)化学品公司、上海晶纯试剂有限公司或美国 Aurora 化学品公司,其余原料和试剂均为天津本地市售。

[0026]　　实施例 1:化合物 Wang-1 的合成

[0027]

Wang-1

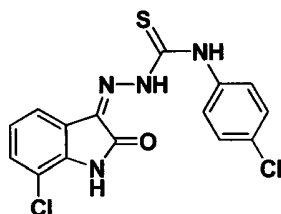[0028]　　将 7- 氯吲哚满二酮 (1.82g,10mmol)和对氯苯基氨硫脲 (2.02g,10mmol)和 5mL 乙酸混合,在 50mL 乙醇－水 (5:1)溶液中回流 6h,然后冷却至室温,乙醇溶液重结晶得到目标化合物 2.76g,收率为 76%。

[0029]　　同样,可以合成本发明的其余所有化合物 Wang-2 ～ Wang-47。

[0030]　　目标化合物的收率、熔点及性状等物化参数见表 1,目标化合物的 ^{1}H NMR、^{13}C NMR、红外光谱、元素分析及质谱等表征数据见表 2。

[0031]　　实施例 2:吲哚满二酮缩氨基硫脲类化合物抗 MRSA 活性测定。

[0032]　　1. 实验材料

[0033]　　Mueller-Hinton Broth(北京奥博星生物技术有限责任公司),胰蛋白胨(英国 OXOID 公司),酵母浸出粉(英国 OXOID 公司),氯化钠(国药集团化学试剂有限公司),96 孔细胞培养板 (flat bottom)(美国康宁公司),阳性对照药物万古霉素(美国 Amresco 公司),二甲基亚砜 DMSO(国药集团化学试剂有限公司),MHB 培养基(使用电子天平称取 24 克 Mueller-Hinton Broth 干粉,溶解于 1000 毫升蒸馏水,调节 pH 至 7.2,使用高压蒸汽灭菌锅在 121℃下灭菌 20 分钟制备所得)。耐甲氧西林金黄色葡萄球菌 (MRSA)临床分离株 (chaoyang 为北京朝阳医院临床分离耐药菌株,6281、6-42、8-21 和 8-24 为解放军 306 医院临床分离耐药菌株,309-1、309-3、309-4、309-6、309-7 和 309-8 为解放军 309 医院临床分离耐药菌株),耐万古霉素肠球菌 (VRE)临床分离株 (VRE-309 为解放军 309 医院临床分离耐药菌株),金黄色葡萄球菌 (SA ATCC6538),枯草杆菌 (BS ATCC6633),所有菌株均以冻存甘油管方式保存于 -80℃冰箱。吲哚满二酮缩氨基硫脲类化合物 Wang-1 ～ Wang47,对照药万古霉素和甲氧西林,以及对比文件 ZL201010534629.6 中活性最好的化合物 WJG-7(结构式见背景技术部分),LB 琼脂平板(使用电子天平称取 10 克 Tryptone、5 克 Yeast extract、5 克氯化钠,溶解于 1000 毫升蒸馏水,调节 pH 至 7.0,加入 20 克琼脂粉,使用高压蒸汽灭菌锅在 121℃下灭菌 20 分钟,分装至无菌培养皿 (30mL/ 培养皿)待冷却凝固后备用)。

[0034]　　2. 菌液准备

[0035]　　测定时取出保藏 MRSA 菌株 (chaoyang)的甘油冻存管,在室温下解冻,划线法接种于 LB 琼脂平板上进行活化,于 37℃培养箱培养 20 小时;用无菌接种环挑取 3 个 MRSA 单菌

(chaoyang)落于 3ml MHB 培养基中,使用涡旋振荡器充分混匀成为菌液母液,使用血球计数板检测菌浓;使用 MHB 培养基将菌液母液稀释至 2×10^4 细胞 /mL,成为待用菌液。

[0036]　　3. 药液准备

[0037]　　用电子分析天平称取待测化合物,以无菌 DMSO 为溶剂配制为 1mg/mL 的化合物溶液;阳性对照药物万古霉素使用无菌 DMSO 配制为 320μg/mL 的溶液,并用 DMSO 依次稀释为 160μg/mL、80μg/mL、40μg/mL、20μg/mL、10μg/mL、5μg/mL、2.5μg/mL 等 8 个浓度梯度。

[0038]　　4. 测定药物抑制 MRSA 的最小抑菌浓度

[0039]　　取无菌 96 孔细胞培养板,使用 8 道微量移液器移取 40μL MHB 培养基至 96 孔细胞培养板各孔;使用微量移液器吸取 2μL 步骤 3 中所述的 8 个浓度梯度的万古霉素溶液,加入 96 孔细胞培养板第一列的 8 个孔中,为阳性对照组;使用微量移液器吸取 2μL 无菌 DMSO,加入 96 孔细胞培养板第十二列的 8 个孔中,为阴性对照组;使用微量移液器吸取 2μL 待检测化合物溶液,依次加入 96 孔细胞培养板第二列至第十一列各孔中;使用 8 道微量移液器移取 40μL 步骤 2 中所述的待用菌液,加入 96 孔细胞培养板各孔中;将上述 96 孔细胞培养板置于 37℃培养箱,培养 16 小时后,观察 96 孔板各孔中的 MRSA(chaoyang)生长状况,呈混浊状态的孔中所加的化合物无抗 MRSA 活性,呈澄清状态的孔中所加的化合物初步判断具有抗 MRSA 活性。将所检测到的各个具有抗 MRSA 活性的化合物从 1mg/mL 的初始浓度依次进行 2 倍梯度稀释为 1mg/ml,500μg/mL,250μg/mL,125μg/mL,62.5μg/mL,31.25μg/mL,15.625μg/mL,7.8125μg/mL 8 个不同浓度的化合物溶液;用同样的方法测定,使用酶标仪读取各孔的吸光值 OD_{600}。对于每个化合物,MRSA(chaoyang)生长被完全抑制的孔所对应的化合物终浓度(化合物溶液浓度 /40)即为该化合物对 MRSA(chaoyang)的最低抑菌浓度 MIC。

[0040]　　同样,可以测定吲哚满二酮缩氨基硫脲类化合物抑制其余所有 MRSA 临床分离菌株、金黄色葡萄球菌、枯草杆菌、VRE 和粪肠球菌生物的活性。

[0041]　　目标化合物的抗菌生物活性数据见表 3 和表 4.

[0042]　　　　　　　　　　　表 1. 目标化合物的物化参数

[0043]

化合物编号	收率(%)	熔点(/℃)	性状
Wang-1	76	251-253	黄色固体
Wang-2	78	246-248	黄色固体
Wang-3	72	252-254	黄色固体
Wang-4	68	241-243	黄色固体
Wang-5	68	227-229	黄色固体
Wang-6	69	219-221	黄色固体

Wang-7	74	254-256	橙黄色固体
Wang-8	78	233-235	橙黄色固体
Wang-9	75	255-257	橙黄色固体
Wang-10	73	247-249	黄色固体
Wang-11	77	251-253	黄色固体
Wang-12	72	242-244	黄色固体
Wang-13	78	230-232	黄色固体
Wang-14	78	241-243	黄色固体
Wang-15	79	230-232	黄色固体
Wang-16	69	230-232	黄色固体
Wang-17	78	254-256	黄色固体
Wang-18	68	240-242	黄色固体
Wang-19	72	241-243	黄色固体
Wang-20	79	206-208	黄色固体
Wang-21	78	249-251	黄色固体
Wang-22	75	246-248	黄色固体
Wang-23	77	219-221	黄色固体
Wang-24	70	219-221	黄色固体
Wang-25	76	230-232	黄色固体
Wang-26	69	210-211	黄色固体
Wang-27	77	255-257	黄色固体
Wang-28	78	243-245	黄色固体
Wang-29	79	251-253	黄色固体
Wang-30	70	270-272	黄色固体

Wang-31	76	243-245	黄色固体
Wang-32	78	232-234	黄色固体
Wang-33	73	247-249	黄色固体
Wang-34	76	249-251	黄色固体
Wang-35	75	252-254	黄色固体
Wang-36	72	264-266	黄色固体
Wang-37	74	241-243	黄色固体
Wang-38	78	251-253	黄色固体
Wang-39	68	166-168	黄色固体
Wang-40	76	256-258	黄色固体
Wang-41	74	258-260	黄色固体
Wang-42	71	261-263	黄色固体
Wang-43	79	256-258	黄色固体
Wang-44	74	260-262	黄色固体
Wang-45	77	236-238	黄色固体
Wang-46	74	234-236	黄色固体
Wang-47	78	259-261	黄色固体

[0044]

[0045]　　　　　表 2. 目标化合物的 ^{1}H NMR、^{13}C NMR、红外谱图、元素分析和质谱数据

[0046]

化合物编号	¹H NMR	¹³C NMR	IR	元素分析	MS or HRMS
Wang-1	(DMSO-d_6, 400 MHz): δ 12.778 (s, 1H, NNH), 11.726 (s, 1H, NH), 10.932 (s, 1H, SCNH), 7.738 (d, 1H, J=7.6 Hz, Ar$_1$-H$_4$), 7.673-7.652 (d, 2H, J=4.4 Hz, Ar$_2$-H$_3$ and Ar$_2$-H$_5$), 7.507-7.485 (d, 2H, J=8.8 Hz, Ar$_2$-H$_2$ and Ar$_2$-H$_6$), 7.455-7.435 (d, 1H, J=8.0 Hz, Ar$_1$-H$_6$), 7.158-7.119 (t, 1H, J=8.0 Hz, Ar$_1$-H$_5$).	(DMSO-d_6, 400 MHz): δ 176.312, 162.770, 139.793, 137.777, 131.889, 131.277, 130.890, 127.627, 123.544, 121.930, 119.852, 118.495, 115.196.	(KBr, υ/cm^{-1}) 3312 (NN-H), 3175 (CON-H), 3065 (Ar-H), 1691 (-CONH-), 1618 (C=N), 1589 and 1476 (Ar-C=C), 1168 (C=S), 1135 (N-N).	理论值: C, 49.33; H, 2.76; N, 15.34. 测定值: C, 49.10; H, 2.95; N, 15.05.	[M-H]⁻ 理论值: 363.0 测定值: 362.9
Wang-2	(DMSO-d_6, 400 MHz): δ 12.737 (s, 1H, NNH), 11.703 (s, 1H, NH), 10.506 (s, 1H, SCNH), 7.791 (d, 1H, J=7.6 Hz, Ar$_1$-H$_4$), 7.669 (d, 1H, J=7.2 Hz, Ar$_1$-H$_6$), 7.450 (d, 1H, J=8.0 Hz, Ar$_2$-H$_5$), 7.306 (t, 1H, J=7.6 Hz, Ar$_1$-H$_5$), 7.160-7.119 (m, 2H, J=7.6 Hz, Ar$_2$-H$_2$ and Ar$_2$-H$_4$), 7.014 (t, 1H, J=7.6 Hz, Ar$_2$-H$_3$), 3.865 (s, 3H, OCH$_3$).	(DMSO-d_6, 400 MHz): δ 176.133, 162.755, 153.053, 139.761, 131.526, 130.802, 127.638, 126.907, 126.460, 123.608, 121.918, 120.087, 119.504, 115,185, 111.748, 55.745.	(KBr, υ/cm^{-1}) 3283 (NN-H), 3179 (CON-H), 3151 (Ar-H), 1697 (-CONH-), 1623 (C=N), 1580 and 1477 (Ar-C=C), 1225 (C=S), 1153 (N-N).	理论值: C, 53.26; H, 3.63; N, 15.53. 测定值: C, 53.24; H, 3.96; N, 15.05.	[M+Na]⁺理论值: 383.0 测定值: 383.1
Wang-3	(DMSO-d_6, 400 MHz): δ 12.723 (s, 1H, NNH), 11.705 (s, 1H, NH), 10.837 (s, 1H, SCNH), 7.768 (d, 1H, J=7.2 Hz, Ar$_1$-H$_4$), 7.496-7.440 (m, 3H, Ar$_2$-H$_3$, Ar$_2$-H$_5$	(DMSO-d_6, 400 MHz): δ 176.302, 162.760, 139.669, 135.802, 135.469, 131.406, 130.720,	(KBr, υ/cm^{-1}) 3287 (NN-H), 3167 (CON-H), 3069 (Ar-H), 1698 (-CONH-), 1624 (C=N), 1544 and 1472 (Ar-C=C), 1294	理论值: C, 55.73; H, 3.80; N, 16.25. 测定值: C, 55.64; H, 3.86; N, 16.08	[M-H]⁻ 理论值: 343.0 测定值: 343.1

[0047]

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	and Ar₁-H₆), 7.256-7.237 (d, 2H, J=7.6 Hz, Ar₂-H₂ and Ar₂-H₆), 7.145 (t, 1H, J=7.6 Hz), 2.347 (s, 3H, CH₃).	128.870, 125.557, 123.499, 122.048, 119.815, 115.159, 20.624.	(C=S), 1140 (N-N).		
Wang-4	(DMSO-d₆, 400 MHz): δ 12.727 (s, 1H, NNH), 11.698 (s, 1H, NH), 10.793 (s, 1H, SCNH), 7.723 (d, 1H, J=6.8 Hz, Ar₁-H₄), 7.449 (d, 1H, J=8.0 Hz, Ar₁-H₆), 7.338-7.300 (m, 4H, Ar₂-H₃, Ar₂-H₄, Ar₂-H₅ and Ar₁-H₅), 2.265 (s, 3H, CH₃).	(DMSO-d₆, 400 MHz): δ 177.184, 162.724, 139.706, 137.312, 135.435, 131.447, 130.705, 130.351, 128.386, 127.446, 126.281, 123.536, 122.096, 119.685, 115.137, 17.636.	(KBr, υ/cm⁻¹) 3314 (NN-H), 3175 (CON-H), 3143 (Ar-H), 1692 (-CONH-), 1622 (C=N), 1587 and 1545 (Ar-C=C), 1295 (C=S), 1193 (N-N).	理论值: C, 55.73; H, 3.80; N, 16.25 测定值: C, 55.82; H, 3.64; N, 16.28	[M+Cl]⁻ 理论值: 337.0 测定值: 379.0
Wang-5	(DMSO-d₆, 400 MHz): δ 12.757 (s, 1H, NNH), 11.726 (s, 1H, NH), 10.912 (s, 1H, SCNH), 7.743 (d, 1H, J=7.2 Hz, Ar₁-H₄), 7.632-7.599 (m, 2H, J=6.8 Hz, Ar₂-H₃ and Ar₂-H₅), 7.451 (d, 1H, Ar₁-H₆), 7.308-7.265 (t, 2H, J=8.4 Hz, Ar₂-H₂ and Ar₂-H₆), 7.146 (t, 1H, J=8.0 Hz, Ar₁-H₅).	(DMSO-d₆, 400 MHz): δ 176.710, 162.762, 158.845, 139.345, 134.721, 131.688, 130.807, 127.920, 128.043, 123.527, 121.978, 119.787, 115.274.	(KBr, υ/cm⁻¹) 3340 (NN-H), 3243 (CON-H), 3148 (Ar-H), 1696 (-CONH-), 1622 (C=N), 1552 and 1518 (Ar-C=C), 1244 (C=S), 1159 (N-N).	理论值: C, 51.65; H, 2.89; N, 16.06. 测定值: C, 51.54; H, 2.74; N, 15.59.	[M-H]⁻ 理论值: 347.0 测定值: 347.1
Wang-6	(DMSO-d₆, 400 MHz): δ 12.719 (s, 1H, NNH), 11.708 (s, 1H, NH), 10.833 (s, 1H, SCNH), 7.761 (d, 1H, J=7.2 Hz, Ar₁-H₄), 7.632-7.599 (m, 3H, J=6.8 Hz, Ar₁-H₆, Ar₂-H₂ and	(DMSO-d₆, 400 MHz): δ 176.145, 162.748, 139.675, 138.218, 137.747, 131.441, 130.724, 128.214,	(KBr, υ/cm⁻¹) 3314 (NN-H), 3197 (CON-H), 3148 (Ar-H), 1693 (-CONH-), 1622 (C=N), 1545 and 1487 (Ar-C=C), 1248 (C=S), 1172	理论值: C, 55.73; H, 3.80; N, 16.25. 测定值: C, 55.90; H, 3.68; N, 16.25.	[M-H]⁻ 理论值: 343.0 测定值: 343.0

[0048]

	Ar₂-H₆), 7.315 (t, 1H, J=7.6 Hz, Ar₂-H₃), 7.148-7.093 (m, 2H, J=8.4 Hz, Ar₁-H₅ and Ar₂-H₄), 2.349 (s, 3H, CH₃).	126.809, 126.025, 123.480, 122.712, 122.011, 119.819, 115.146, 20.921.	(N-N).		
Wang-7	(DMSO-d₆, 400 MHz): δ 12.778 (s, 1H, NNH), 11.585 (s, 1H, NH), 10.926 (s, 1H, SCNH), 7.778 (d, 1H, J=7.6 Hz, Ar₁-H₄), 7.674-7.653 (d, 2H, J=8.4 Hz, Ar₂-H₃ and Ar₂-H₅), 7.572 (t, 1H, J=8.0 Hz, Ar₁-H₆), 7.506-7.485 (d, 2H, J=8.4 Hz, Ar₂-H₂ and Ar₂-H₆), 7.078 (t, 1H, J=8.0 Hz, Ar₁-H₆).	(DMSO-d₆, 400 MHz): δ 176.375, 162.765, 141.490, 137.340, 133.790, 132.014, 130.185, 128.339, 127.314, 123.864, 121.952, 120.265, 103.386.	(KBr, υ/cm⁻¹) 3310 (NN-H), 3129 (CON-H), 3011 (Ar-H), 1696 (-CONH-), 1621 (C=N), 1590 and 1535 (Ar-C=C), 1435 (C=S), 1160 (N-N).		
Wang-8	(DMSO-d₆, 400 MHz): δ 12.716 (s, 1H, NNH), 11.570 (s, 1H, NH), 10.836 (s, 1H, SCNH), 7.803 (d, 1H, J=7.2 Hz, Ar₁-H₄), 7.569 (d, 1H, J=8.0 Hz, Ar₁-H₆), 7.442-7.419 (m, 2H, J=9.2 Hz, Ar₂-H₃ and Ar₂-H₄), 7.317 (t, 1H, J=7.6 Hz, Ar₁-H₅), 7.114-7.056 (m, 2H, J=7.6 Hz, Ar₂-H₂ and Ar₂-H₆), 2.350 (s, 3H, CH₃).	(DMSO-d₆, 400 MHz): δ 176.168, 162.782, 141.396, 138.225, 137.755, 133.662, 131.635, 128.222, 126.819, 126.037, 123.838, 122.722, 122.057, 120.258, 103.332, 20.915.	(KBr, υ/cm⁻¹) 3309 (NN-H), 3214 (CON-H), 3198 (Ar-H), 1696 (-CONH-), 1617 (C=N), 1576 and 1541 (Ar-C=C), 1218 (C=S), 1139 (N-N).		[M-H]⁻ 理论值: 386.9915 测定值: 386.9924
Wang-9	(DMSO-d₆, 400 MHz): δ 12.788 (s, 1H, NNH), 11.595 (s, 1H, NH), 10.936 (s, 1H, SCNH), 7.787 (d, 1H, J=6.8 Hz, Ar₁-H₄), 7.684-7.664 (d, 2H,	(DMSO-d₆, 400 MHz): δ 176.381, 162.773, 141.498, 137.348, 133.497, 132.018,	(KBr, υ/cm⁻¹) 3308 (NN-H), 3122 (CON-H), 3056 (Ar-H), 1696 (-CONH-), 1620 (C=N), 1590 and 1534	理论值: C, 43.98; H, 2.46; N, 13.68. 测定值: C, 43.69; H, 2.54;	[M-H]⁻ 理论值: 408.9 测定值: 408.9

[0049]

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	J=8.0 Hz, Ar₂-H₃ and Ar₂-H₅), 7.580 (d, 1H, *J*=7.6 Hz, Ar₁-H₆), 7.515-7.496 (d, 2H, *J*=7.6 Hz, Ar₂-H₂ and Ar₂-H₆), 7.105 (t, 1H, *J*=7.6 Hz, Ar₁-H₅).	130.195, 128.348, 127.320, 123.871, 121.959, 120.274, 103.397	(Ar-C=C), 1240 (C=S), 1158 (N-N).	N, 13.52	
Wang-10	(DMSO-*d₆*, 400 MHz): δ 12.822 (s, 1H, NNH), 11.316 (s, 1H, NH), 10.741 (s, 1H, SCNH), 7.627 (d, 1H, *J*=7.2 Hz, Ar₁-H₄), 7.502-7.482 (d, 2H, *J*=8.0 Hz, Ar₂-H₃ and Ar₂-H₅), 7.247-7.190 (m, 3H, *J*=7.6 Hz, Ar₁-H₆, Ar₂-H₂ and Ar₂-H₆), 7.028 (t, 1H, *J*=7.6 Hz, Ar₁-H₅), 2.343 (s, 3H, Ar₂-CH₃), 2.248 (s, 3H, Ar₁-CH₃).	(DMSO-*d₆*, 400 MHz): δ 176.264, 163.125, 141.059, 135.900, 135.312, 132.577, 132.501, 128.810, 125.525, 122.304, 120.465, 119.602, 118.806, 20.615, 15.886.	(KBr, υ/cm⁻¹) 3302 (NN-H), 3164 (CON-H), 3063 (Ar-H), 1693 (-CONH-), 1626 (C=N), 1585 and 1478 (Ar-C=C), 1211 (C=S), 1135 (N-N).	理论值: C, 62.94; H, 4.97; N, 17.27. 测定值: C, 62.70; H, 5.15; N, 17.28	[M-H]⁻ 理论值: 323.1 测定值: 323.1
Wang-11	(DMSO-*d₆*, 400 MHz): δ 12.908 (s, 1H, NNH), 11.349 (s, 1H, NH), 10.861 (s, 1H, SCNH), 7.694-7.632 (m, 3H, *J*=6.4 Hz, Ar₁-H₄, Ar₂-H₃ and Ar₂-H₅), 7.508-7.425 (m, 2H, *J*=7.6 Hz, Ar₂-H₂ and Ar₂-H₆), 7.222 (d, 1H *J*=7.6 Hz, Ar₁-H₆), 7.047 (t, 1H *J*=8.0 Hz, Ar₁-H₅), 2.262 (s, 3H, CH₃).	(DMSO-*d₆*, 400 MHz): δ 176.375, 163.145, 141.197, 137.472, 132.962, 132.756, 130.063, 128.291, 127.283, 122.362, 120.546, 119.518, 118.154, 15.893.	(KBr, υ/cm⁻¹) 3310 (NN-H), 3173 (CON-H), 3057 (Ar-H), 1696 (-CONH-), 1626 (C=N), 1595 and 1539 (Ar-C=C), 1209 (C=S), 1155 (N-N).	理论值: C, 55.73; H, 3.80; N, 16.25. 测定值: C, 56.07; H, 4.10; N, 16.46.	[M+H]⁺ 理论值: 345.0577 测定值: 345.0565
Wang-12	(DMSO-*d₆*, 400 MHz): δ 12.885 (s, 1H, NNH), 11.331 (s, 1H, NH), 10.839 (s, 1H, SCNH), 7.683-7.663 (m, 2H, *J*=8.0 Hz,	(DMSO-*d₆*, 400 MHz): δ 176.342, 163.126, 141.177, 137.450, 132.936,	(KBr, υ/cm⁻¹) 3308 (NN-H), 3165 (CON-H), 3052 (Ar-H), 1695 (-CONH-),		

[0050]

	Ar$_2$-H$_3$ and Ar$_2$-H$_5$), 7.605 (d, 1H J=7.2 Hz, Ar$_1$-H$_4$), 7.488-7.477 (m, 2H, J=4.4 Hz, Ar$_2$-H$_2$ and Ar$_2$-H$_6$), 7.199 (d, 1H J=7.2 Hz, Ar$_1$-H$_6$), 7.027 (t, 1H J=7.6 Hz, Ar$_1$-H$_5$), 2.237 (s, 3H, CH$_3$).	132.734, 130.042, 128.274, 127.270, 122.340, 120.530, 119.491, 118.838, 15.876.	1625 (C=N), 1572 and 1539 (Ar-C=C), 1209 (C=S), 1153 (N-N).		
Wang-13	(DMSO-d_6, 400 MHz): δ 12.745 (s, 1H, NNH), 11.782 (s, 1H, NH), 10.685 (s, 1H, SCNH), 7.606 (d, 1H, J=7.2 Hz, Ar$_1$-H$_4$), 7.332-7.296 (m, 5H, J=8.0 Hz, Ar$_1$-H$_5$, Ar$_1$-H$_6$, Ar$_2$-H$_3$, Ar$_2$-H$_4$ and Ar$_2$-H$_5$), 7.140 (m, 1H, J=5.2 Hz, Ar$_1$-H$_5$), 2.259 (s, 3H, CH$_3$).	(DMSO-d_6, 400 MHz): δ 177.193, 162.468, 137.320, 135.432, 130.343, 129.134, 128.390, 127.436, 126.762, 123.275, 123.217, 123.050, 117.976, 117.804, 117.292, 17.619.	(KBr, υ/cm^{-1}) 3242 (NN-H), 3176 (CON-H), 3059 (Ar-H), 1694 (-CONH-), 1646 (C=N), 1541 and 1463 (Ar-C=C), 1149 (C=S), 1029 (N-N).	理论值: C, 58.52; H, 3.99; N, 17.06. 测定值: C, 58.40; H, 4.03; N, 17.30	[M-H]$^-$ 理论值: 327.1 测定值: 327.1
Wang-14	(DMSO-d_6, 400 MHz): δ 12.775 (s, 1H, NNH), 11.797 (s, 1H, NH), 10.890 (s, 1H, SCNH), 7.626-7.591 (m, 3H, J=7.2 Hz, Ar$_1$-H$_4$, Ar$_2$-H$_3$ and Ar$_2$-H$_5$), 7.319-7.252 (m, 3H, J=9.2 Hz, Ar$_1$-H$_6$, Ar$_1$-H$_2$ and Ar$_1$-H$_6$), 7.140 (m, 1H J=4.4 Hz, Ar$_1$-H$_5$).	(DMSO-d_6, 400 MHz): δ 176.723, 161.250, 162.487, 148.092, 134.724, 131.588, 129.303, 128.020, 123.252, 122.913, 118.058, 117.350, 115.246.	(KBr, υ/cm^{-1}) 3294 (NN-H), 3178 (CON-H), 3046 (Ar-H), 1695 (-CONH-), 1646 (C=N), 1515 and 1479 (Ar-C=C), 1167 (C=S), 1137 (N-N).	理论值: C, 54.21; H, 3.03; N, 16.86. 测定值: C, 54.44; H, 3.00; N, 16.57.	[M-H]$^-$ 理论值: 331.1 测定值: 331.0
Wang-15	(DMSO-d_6, 400 MHz): δ 12.753 (s, 1H, NNH), 11.807 (s, 1H, NH), 10.845 (s, 1H, SCNH), 7.654 (d, 1H, J=7.2 Hz, Ar$_1$-H$_4$), 7.450-7.426 (m,	(DMSO-d_6, 400 MHz): δ 176.188, 162.505, 148.086, 138.237, 137.755, 131.393,	(KBr, υ/cm^{-1}) 3298 (NN-H), 3179 (CON-H), 3048 (Ar-H), 1695 (-CONH-), 1644 (C=N), 1593 and 1548		[M+H]$^+$ 理论值: 329.0872 测定值: 329.0865

[0051]

	2H, *J*=6.8 Hz, Ar₁-H₅ and Ar₁-H₆), 7.344-7.284 (m, 2H, *J*=6.8 Hz, Ar₂-H₃ and Ar₂-H₄), 7.159-7.106 (m, 2H, *J*=7.2 Hz, Ar₂-H₂ and Ar₂-H₆), 2.358 (s, 3H, CH₃).	129.255, 128.223, 126.822, 123.239, 123.180, 122.975, 122.749, 118.020, 117.847, 20.920.	(Ar-C=C), 1247 (C=S), 1149 (N-N).		
Wang-16	(DMSO-d_6, 400 MHz): δ 12.779 (s, 1H, NNH), 11.805 (s, 1H, NH), 10.850 (s, 1H, SCNH), 7.662 (d, 1H, *J*=7.6 Hz, Ar₁-H₄), 7.370-7.297 (m, 3H, *J*=6.8 Hz Ar₁-H₅, Ar₁-H₆ and Ar₂-H₅), 7.248 (d, 1H, *J*=8.0 Hz, Ar₂-H₆), 7.168-7.117 （m, 1H, *J*=8.4 Hz, Ar₂-H₄), 6.888-6.863 (m, 1H, *J*=6.8 Hz, Ar₂-H₂)， 3.797 (s, 3H, OCH₃).	(DMSO-d_6, 400 MHz): δ 176.058, 162.514, 159.188, 148.097, 145.680, 139.442, 131.499, 129.144, 123.259, 122.940, 118.073, 117.900, 117.599, 111.637, 111.129, 55.221.	(KBr, υ/cm^{-1}) 3302 (NN-H), 3162 (CON-H), 3080 (Ar-H), 1695 (-CONH-), 1595 (C=N), 1541 and 1454 (Ar-C=C), 1148 (C=S), 1049 (N-N).	理论值: C, 55.80; H, 3.81; N, 16.27. 测定值: C, 55.84; H, 4.03; N, 16.13.	[M-H]⁻ 理论值: 343.1 测定值: 343.1
Wang-17	(DMSO-d_6, 400 MHz): δ 12.709 (s, 1H, NNH), 11.567 (s, 1H, NH), 10.835 (s, 1H, SCNH), 7.795 (d, 1H, *J*=7.6 Hz, Ar₁-H₄), 7.567 (d, 1H, *J*=8.0 Hz, Ar₁-H₆), 7.480-7.460 (d, 2H, *J*=8.0 Hz Ar₂-H₃ and Ar₂-H₅), 7.246-7.226 (d, 2H, *J*=8.0 Hz Ar₂-H₂ and Ar₂-H₆), 7.073 (t, 1H, *J*=8.0 Hz Ar₁-H₅)， 2.336 (s, 3H, CH₃).	(DMSO-d_6, 400 MHz): δ 176.280, 162.760, 141.365, 135.785, 135.464, 133.630, 131.574, 128.863, 125.575, 123.833, 122.064, 120.232, 103.328, 20.619.	(KBr, υ/cm^{-1}) 3310 (NN-H), 3125 (CON-H), 3050 (Ar-H), 1694 (-CONH-), 1595 (C=N), 1535 and 1479 (Ar-C=C), 1152 (C=S), 1132 (N-N).	理论值: C, 49.37; H, 3.37; N, 14.39. 测定值: C, 49.12; H, 3.42; N, 14.16.	[M-H]⁻ 理论值: 389.0 测定值: 389.0
Wang-18	(DMSO-d_6, 400 MHz): δ 12.809 (s,	(DMSO-d_6, 400 MHz): δ	(KBr, υ/cm^{-1}) 3322 (NN-H),	理论值:	[M-H]⁻ 理论值:

[0052]

	1H, NNH), 11.582 (s, 1H, NH), 10.788 (s, 1H, SCNH), 7.728 (d, 1H, J=7.2 Hz, Ar$_1$-H$_4$), 7.580 (d, 1H, J=8.0 Hz, Ar$_1$-H$_6$), 7.506 (t, 1H, J=7.2 Hz, Ar$_1$-H$_5$), 7.444-7.267 (m, 3H, J=6.4 Hz, Ar$_2$-H$_2$, Ar$_2$-H$_3$ and Ar$_2$-H$_5$), 7.080 (t, 1H, J=8.0 Hz, Ar$_2$-H$_4$).	177.913, 162.725, 158.488, 141.564, 133.792, 132.188, 130.133, 129.165, 126.412, 124.409, 123.909, 121.991, 120.111, 116.113, 103.391.	3182 (CON-H), 3067 (Ar-H), 1698 (-CONH-), 1620 (C=N), 1542 and 1435 (Ar-C=C), 1156 (C=S), 1131 (N-N).	C, 45.82; H, 2.56; N, 14.25. 测定值：C, 45.95; H, 2.53; N, 14.13.	393.0 测定值：393.1
Wang-19	(DMSO-d_6, 400 MHz): δ 12.714 (s, 1H, NNH), 11.565 (s, 1H, NH), 10.794 (s, 1H, SCNH), 7.754 (d, 1H, J=6.8z, Ar$_1$-H$_4$), 7.572 (d, 1H, J=7.6 Hz, Ar$_1$-H$_6$), 7.333-7.290 (m, 4H, J=8.4 Hz, Ar$_1$-H$_5$ Ar$_2$-H$_2$, Ar$_2$-H$_3$ and Ar$_2$-H$_5$), 7.072 (t, 1H, J=7.6 Hz, Ar$_1$-H$_6$), 2.253 (s, 3H, CH$_3$).	(DMSO-d_6, 400 MHz): δ 177.142, 162.726, 141.405, 137.300, 135.439, 133.618, 131.617, 130.343, 128.397, 127.449, 126.280, 123.867, 122.111, 120.108, 103.109, 17.634.	(KBr, v/cm^{-1}) 3310 (NN-H), 3161 (CON-H), 3057 (Ar-H), 1692 (-CONH-), 1619 (C=N), 1580 and 1472 (Ar-C=C), 1190 (C=S), 1153 (N-N).		[M-H]$^-$ 理论值: 386.9915 测定值: 386.9913
Wang-20	(DMSO-d_6, 400 MHz): δ 12.743 (s, 1H, NNH), 11.577 (s, 1H, NH), 10.846 (s, 1H, SCNH), 7.806 (d, 1H, J=7.2 Hz, Ar$_1$-H$_4$), 7.570 (d, 1H, J=8.0 Hz, Ar$_1$-H$_6$), 7.361-7.231 (m, 3H, J=8.0 Hz, Ar$_1$-H$_5$, Ar$_2$-H$_2$ and Ar$_2$-H$_6$), 7.077 (t, 1H, J=8.0 Hz, Ar$_2$-H$_3$), 6.866 (d, 1H, J=7.6 Hz, Ar$_2$-H$_4$), 3.787 (s, 3H, OCH$_3$).	(DMSO-d_6, 400 MHz): δ 175.989, 162.762, 159.166, 141.412, 139.415, 133.692, 131.713, 129.318, 123.833, 122.004, 120.304, 117.536, 111.608, 111.104, 103.349, 55.210.	(KBr, v/cm^{-1}) 3246 (NN-H), 3144 (CON-H), 3065 (Ar-H), 1698 (-CONH-), 1620 (C=N), 1539 and 1492 (Ar-C=C), 1156 (C=S), 1129 (N-N).	理论值 C, 47.42; H, 3.23; N, 13.82. 测定值 C, 47.29; H, 3.40; N, 13.68.	[M-H]$^-$ 理论值: 405.0 测定值: 404.9
Wang-21	(DMSO-d_6, 400	(DMSO-d_6,	(KBr, v/cm^{-1})		[M-H]$^-$

[0053]

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	MHz,): δ 12.783 (s, 1H, NNH), 11.729 (s, 1H, NH), 10.927 (s, 1H, SCNH), 7.742 (d, 1H, J=7.6 Hz, Ar₁-H₄), 7.692-7.552 (m, 4H, J=7.6 Hz, Ar₂-H₂, Ar₂-H₃, Ar₂-H₅ and Ar₂-H₆), 7.455 (d, 1H, J=8.0 Hz, Ar₁-H₆), 7.151 (t, 1H, J=7.6 Hz, Ar₁-H₅).	400 MHz): δ 176.312, 162.770, 139.793, 137.777, 131.889, 131.277, 130.890, 127.627, 123.544, 121.930, 119.852, 118.495, 115.196.	3310 (NN-H), 3175 (CON-H), 3066 (Ar-H), 1690 (-CONH-), 1620 (C=N), 1586 and 1527 (Ar-C=C), 1170 (C=S), 1137 (N-N).	理论值: C, 43.98; H, 2.46; N, 13.68. 测定值: C, 44.05; H, 2.38; N, 13.98.	理论值: 408.9 测定值: 408.9
Wang-22	(DMSO-d₆, 400 MHz): δ 12.794 (s, 1H, NNH), 11.739 (s, 1H, NH), 10.953 (s, 1H, SCNH), 7.785-7.637 (m, 3H, J=8.0 Hz, Ar₁-H₄, Ar₁-H₆, and Ar₂-H₄), 7.512-7.347 (m, 3H, J=7.6 Hz, Ar₁-H₅, Ar₂-H₂ and Ar₂-H₆), 7.151 (t, 1H, J=8.0 Hz, Ar₂-H₃).	(DMSO-d₆, 400 MHz): δ 176.251, 162.755, 139.814, 137.333, 132.462, 131.963, 130.181, 128.332, 127.303, 125.884, 124.033, 123.521, 121.881, 119.873, 115.206.	(KBr, υ/cm⁻¹) 3320 (NN-H), 3165 (CON-H), 3050 (Ar-H), 1691 (-CONH-), 1621 (C=N), 1586 and 1525 (Ar-C=C), 1164 (C=S), 1137 (N-N).	理论值: C, 49.33; H, 2.76; N, 15.34. 测定值: C, 49.75; H, 3.02; N, 15.63.	[M-H]⁻ 理论值: 363.0 测定值: 363.0
Wang-23	(DMSO-d₆, 400 MHz): δ 12.743 (s, 1H, NNH), 11.720 (s, 1H, NH), 10.858 (s, 1H, SCNH), 7.770 (d, 1H, J=7.6 Hz, Ar₁-H₄), 7.453 (d, 1H, J=8.0 Hz, Ar₁-H₆), 7.343 (t, 1H, J=8.0 Hz, Ar₁-H₅), 7.288 (s, 1H, Ar₂-H₆), 7.237 (d, 1H, J=7.6 Hz, Ar₂-H₄), 7.144 (t, 1H, J=7.6 Hz, Ar₂-H₃), 6.868 (d, 1H, J=6.4 Hz, Ar₂-H₂), 3.787 (s, 3H, OCH₃).	(DMSO-d₆, 400 MHz): δ 176.026, 162.772, 159.173, 139.720, 139.420, 131581, 130.794, 129.150, 126.520, 121.996, 119.894, 117.567, 115.151, 111.634, 111.131, 55.212.	(KBr, υ/cm⁻¹) 3302 (NN-H), 3179 (CON-H), 3018 (Ar-H), 1695 (-CONH-), 1624 (C=N), 1594 and 1542 (Ar-C=C), 1204 (C=S), 1149 (N-N).	理论值: C, 53.26; H, 3.63; N, 15.53. 测定值: C, 53.45; H, 3.59; N, 15.34.	[M-H]⁻ 理论值: 359.0 测定值: 359.0
Wang-24	(DMSO-d₆, 400	(DMSO-d₆,	(KBr, υ/cm⁻¹)		[M-H]⁻

[0054]

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	MHz): δ 12.814 (s, 1H, NNH), 11.713 (s, 1H, NH), 10.784 (s, 1H, SCNH), 7.691 (d, 1H, J=7.2 Hz, Ar$_1$-H$_4$), 7.510 (d, 1H, J=7.6 Hz, Ar$_1$-H$_6$), 7.460-7.268 (m, 4H, J=8.0 Hz, Ar$_2$-H$_2$, Ar$_2$-H$_3$, Ar$_2$-H$_5$ and Ar$_2$-H$_6$), 7.140 (t, 1H, J=8.0 Hz, Ar$_1$-H$_5$).	400 MHz): δ 177.906, 162.716, 156.022, 139.857, 132.018, 131.877, 129.150, 126.451, 124.426, 123.574, 121.989, 119.686, 116.103, 115.909, 115.204.	3323 (NN-H), 3176 (CON-H), 3066 (Ar-H), 1697 (-CONH-), 1621 (C=N), 1592 and 1541 (Ar-C=C), 1199 (C=S), 1147 (N-N).	理论值: C, 51.65; H, 2.89; N, 16.06. 测定值: C, 51.39; H, 3.05; N, 16.01.	理论值: 347.0 测定值: 347.0
Wang-25	(DMSO-d_6, 400 MHz): δ 12.833 (s, 1H, NNH), 11.819 (s, 1H, NH), 10.944 (s, 1H, SCNH), 7.653-7.635 (m, 2H, J=7.2 Hz, Ar$_1$-H$_4$ and Ar$_1$-H$_6$), 7.533-7.452 (m, 2H, J=8.0 Hz, Ar$_1$-H$_5$ and Ar$_2$-H$_4$), 7.314 (t, 1H, J=8.8 Hz, Ar$_2$-H$_5$), 7.167-7.118 (m, 2H, J=4.0 Hz, Ar$_2$-H$_2$ and Ar$_2$-H$_6$).	(DMSO-d_6, 400 MHz): δ 176.225, 162.509, 148.110, 145.690, 140.108, 131.809, 129.884, 129.395, 123.285, 122.843, 121.321, 118.196, 117.502, 112.637, 112.411.	(KBr, υ/cm^{-1}) 3286 (NN-H), 3160 (CON-H), 3068 (Ar-H), 1696 (-CONH-), 1644 (C=N), 1602 and 1540 (Ar-C=C), 1213 (C=S), 1148 (N-N).	理论值: C, 54.21; H, 3.03; N, 16.86. 测定值: C, 54.07; H, 3.27; N, 17.06.	[M-H]$^-$ 理论值: 331.1 测定值: 331.1
Wang-26	(DMSO-d_6, 400 MHz): δ 12.820 (s, 1H, NNH), 11.812 (s, 1H, NH), 10.927 (s, 1H, SCNH), 7.793 (d, 1H, J=7.2 Hz, Ar$_1$-H$_4$), 7.663-7.616 (m, 2H, J=4.8 Hz, Ar$_1$-H$_5$ and Ar$_1$-H$_6$), 7.458 (t, 1H, J=8.0 Hz, Ar$_2$-H$_3$), 7.351-7.270 (m, 3H, J=6.8 Hz, Ar$_2$-H$_2$, Ar$_2$-H$_4$ and Ar$_2$-H$_6$).	(DMSO-d_6, 400 MHz): δ 176.255, 162.490, 148.091, 145.671, 142.221, 139.816, 132.459, 129.951, 125.863, 124.031, 123.257, 120.635, 118.183, 117.467, 115.345.	(KBr, υ/cm^{-1}) 3313 (NN-H), 3167 (CON-H), 3077 (Ar-H), 1692 (-CONH-), 1645 (C=N), 1589 and 1530 (Ar-C=C), 1210 (C=S), 1161 (N-N).	理论值: C, 51.65; H, 2.89; N, 16.06. 测定值: C, 51.45; H, 2.68; N, 16.05.	[M-H]$^-$ 理论值: 347.0 测定值: 347.0
Wang-27	(DMSO-d_6, 400 MHz): δ 12.719 (s,	(DMSO-d_6, 400 MHz): δ	(KBr, υ/cm^{-1})	理论值	[M-H]$^-$ 理论值:

[0055]

	1H, NNH), 11.792 (s, 1H, NH), 10.814 (s, 1H, SCNH), 7.632 (d, 1H, J=6.8 Hz, Ar_1-H_4), 7.471-7.451 (m, 2H, J=8.0 Hz, Ar_2-H_3 and Ar_2-H_5), 7.303 (t, 1H, J=9.2 Hz, Ar_1-H_5), 7.132 (d, 1H, J=4.0 Hz, Ar_1-H_6), 7.004-6.984 (m, 2H, J=8.0 Hz, Ar_2-H_2 and Ar_2-H_6), 3.792 (s, 3H, OCH_3).	176.506, 162.496, 157.420, 148.075, 131.161, 129.198, 129.066, 127.262, 123.238, 117.951, 117.785, 117.356, 113.577, 55.258.	3329 (NN-H), 3189 (CON-H), 3041 (Ar-H), 1698 (-CONH-), 1643 (C=N), 1597 and 1521 (Ar-C=C), 1239 (C=S), 1158 (N-N).	C, 55.80; H, 3.81; N, 16.27. 测定值 C, 55.57; H, 3.59; N, 16.08.	343.1 测定值: 343.1
Wang-28	(DMSO-d_6, 400 MHz): δ 12.799 (s, 1H, NNH), 11.734 (s, 1H, NH), 10.954 (s, 1H, SCNH), 7.755 (d, 1H, J=7.6 Hz, Ar_1-H_4), 7.625 (d, 1H, J=11.2 Hz, Ar_1-H_6), 7.521-7.446 (m, 3H, J=7.6 Hz, Ar_1-H_5, Ar_2-H_3 and Ar_2-H_4), 7.168-7.115 (m, 2H, J=8.0 Hz, Ar_2-H_2 and Ar_2-H_6).	(DMSO-d_6, 400 MHz): δ 176.204, 162.778, 160.378, 140.084, 139.823, 131.952, 130.922, 129.991, 129.900, 125.544, 121.900, 121.340, 119.903, 115.202, 112.657.	(KBr, υ/cm^{-1}) 3282 (NN-H), 3136 (CON-H), 3017 (Ar-H), 1698 (-CONH-), 1623 (C=N), 1591 and 1530 (Ar-C=C), 1248 (C=S), 1179 (N-N).	理论值: C, 51.65; H, 2.89; N, 16.01. 测定值: C, 51.55; H, 3.05; N, 16.01.	[M-H]$^-$ 理论值: 347.0 测定值: 347.0
Wang-29	(DMSO-d_6, 400 MHz): δ 12.692 (s, 1H, NNH), 11.702 (s, 1H, NH), 10.815 (s, 1H, SCNH), 7.750 (d, 1H, J=7.6 Hz, Ar_1-H_4), 7.471-7.440 (m, 3H, J=7.2 Hz, Ar_1-H_5, Ar_2-H_6 and Ar_2-H_4), 7.142 (t, 1H, J=8.0 Hz, Ar_2-H_3), 7.005-6.982 (m, 2H, J=9.2 Hz, Ar_2-H_2 and Ar_2-H_6), 3.791 (s, 3H, OCH_3).	(DMSO-d_6, 400 MHz): δ 176.504, 162.757, 157.432, 139.638, 131.339, 131.157, 130.692, 127.249, 123.512, 122.073, 119.765, 115.132, 113.590, 55.265.	(KBr, υ/cm^{-1}) 3330 (NN-H), 3240 (CON-H), 3128 (Ar-H), 1702 (-CONH-), 1623 (C=N), 1586 and 1518 (Ar-C=C), 1239 (C=S), 1133 (N-N).	理论值: C, 53.26; H, 3.63; N, 15.53. 测定值: C, 53.42; H, 3.90; N, 15.75.	[M+NH$_4$]$^+$ 理论值: 378.1 测定值: 378.9

[0056]

	¹H NMR	¹³C NMR	IR	元素分析	MS
Wang-30	(DMSO-d_6, 400 MHz): δ 12.746 (s, 1H, NNH), 11.581 (s, 1H, NH), 10.521 (s, 1H, SCNH), 7.779 (d, 1H, J=7.6 Hz, Ar$_1$-H$_4$), 7.721 (d, 1H, J=7.2 Hz, Ar$_1$-H$_6$), 7.590 (d, 1H, J=7.6 Hz, Ar$_2$-H$_5$), 7.319 (t, 1H, J=7.6 Hz, Ar$_1$-H$_5$), 7.163 (d, 1H, J=8.0 Hz, Ar$_2$-H$_5$), 7.089 (t, 1H, J=8.0 Hz, Ar$_2$-H$_3$), 7.025 (t, 1H, J=7.6 Hz, Ar$_2$-H$_4$), 3.872 (s, 3H, OCH$_3$).	(DMSO-d_6, 400 MHz): δ 176.196, 162.776, 153.126, 141.483, 133.737, 131.714, 127.690, 126.923, 126.578, 123.962, 121.969, 120.082, 119.956, 111.779, 103.382, 55.778.	(KBr, υ/cm^{-1}) 3294 (NN-H), 3162 (CON-H), 3066 (Ar-H), 1691 (-CONH-), 1652 (C=N), 1544 and 1479 (Ar-C=C), 1224 (C=S), 1139 (N-N).	理论值: C, 47.42; H, 3.23; N, 13.82.　　测定值: C, 47.22; H, 3.35; N, 13.83.	[M-H]⁻ 理论值: 405.0　　测定值: 405.0
Wang-31	(DMSO-d_6, 400 MHz): δ 12.805 (s, 1H, NNH), 11.594 (s, 1H, NH), 10.946 (s, 1H, SCNH), 7.801 (d, 1H, J=7.6 Hz, Ar$_1$-H$_4$), 7.639 (d, 1H, J=6.8 Hz, Ar$_1$-H$_6$), 7.580 (d, 1H, J=5.2 Hz, Ar$_2$-H$_4$), 7.534-7.462 (m, 2H, J=6.8 Hz, Ar$_1$-H$_5$ and Ar$_2$-H$_5$), 7.158-7.070 (m, 2H, J=7.6 Hz, Ar$_2$-H$_2$ and Ar$_2$-H$_6$).	(DMSO-d_6, 400 MHz): δ 176.203, 162.776, 141.534, 139.992, 133.843, 132.104, 129.987, 129.894, 123.874, 121.931, 121.307, 120.331, 112.644, 112.399, 103.398.	(KBr, υ/cm^{-1}) 3233 (NN-H), 3132 (CON-H), 3058 (Ar-H), 1694 (-CONH-), 1638 (C=N), 1548 and 1488 (Ar-C=C), 1182 (C=S), 1133 (N-N).	理论值: C, 45.82; H, 2.56; N, 14.25.　　测定值: C, 45.65; H, 2.65; N, 14.44.	[M-H]⁻ 理论值: 393.0　　测定值: 392.9
Wang-32	(DMSO-d_6, 400 MHz): δ 12.795 (s, 1H, NNH), 11.597 (s, 1H, NH), 10.948 (s, 1H, SCNH), 7.794-7.777 (m, 2H, J=8.0 Hz, Ar$_1$-H$_4$ and Ar$_2$-H$_6$), 7.649 (d, 1H, J=7.6 Hz, Ar$_1$-H$_6$), 7.580 (d, 1H, J=8.0 Hz, Ar$_2$-H$_4$), 7.468 (t, 1H, J=8.0 Hz, Ar$_1$-H$_5$), 7.352 (d, 1H, J=8.0 Hz,	(DMSO-d_6, 400 MHz): δ 176.272, 162.776, 141.545, 139.815, 133.856, 132.459, 132.157, 129.991, 125.902, 125.084, 124.063, 123.879, 121.923,	(KBr, υ/cm^{-1}) 3320 (NN-H), 3222 (CON-H), 3121 (Ar-H), 1697 (-CONH-), 1618 (C=N), 1587 and 1528 (Ar-C=C), 1219 (C=S), 1160 (N-N).	理论值: C, 43.98; H, 2.46; N, 13.68.　　测定值: C, 43.78; H, 2.57; N, 13.57.	[M-H]⁻ 理论值: 408.9　　测定值: 408.9

[0057]

	Ar₂-H₂), 7.6084 (d, 1H, J=8.0 Hz, Ar₂-H₃).	120.312, 103.396.			
Wang-33	(DMSO-d₆, 400 MHz): δ 12.782 (s, 1H, NNH), 11.590 (s, 1H, NH), 10.924 (s, 1H, SCNH), 7.781 (d, 1H, J=7.2 Hz, Ar₁-H₄), 7.646-7.573 (m, 5H, J=7.6 Hz, Ar₁-H₆, Ar₂-H₂, Ar₂-H₃, Ar₂-H₅ and Ar₂-H₆), 7.085 (t, 1H, J=8.0 Hz, Ar₁-H₅).	(DMSO-d₆, 400 MHz): δ 176.314, 162.777, 141.504, 137.779, 133.812, 132.057, 131.277, 127.626, 123.880, 121.960, 120.280, 118.491, 103.384.	(KBr, υ/cm⁻¹) 3302 (NN-H), 3240 (CON-H), 3021 (Ar-H), 1693 (-CONH-), 1626 (C=N), 1585 and 1534 (Ar-C=C), 1211 (C=S), 1153 (N-N).	理论值: C, 39.67; H, 2.22; N, 12.34. 测定值: C, 39.46; H, 2.68; N, 12.25.	[M-H]⁻ 理论值: 452.9 测定值: 452.9
Wang-34	(DMSO-d₆, 400 MHz): δ 12.703 (s, 1H, NNH), 11.589 (s, 1H, NH), 10.814 (s, 1H, SCNH), 7.798 (d, 1H, J=6.8 Hz, Ar₁-H₄), 7.580 (d, 1H, J=7.6 Hz, Ar₁-H₆), 7.487-7.467 (d, 2H, J=8.0 Hz, Ar₂-H₃ and Ar₂-H₅), 7.087 (t, 1H, J=7.2 Hz, Ar₁-H₅), 7.014-6.994 (d, 2H, J=8.0 Hz, Ar₂-H₂ and Ar₂-H₆), 3.803 (s, 3H, OCH₃).	(DMSO-d₆, 400 MHz): δ 176.053, 162.764, 157.443, 141.352, 133.608, 131.490, 131.236, 127.236, 123.847, 122.107, 120.190, 113.600, 103.335, 55.280.	(KBr, υ/cm⁻¹) 3302 (NN-H), 3261 (CON-H), 3047 (Ar-H), 1695 (-CONH-), 1612 (C=N), 1595 and 1542 (Ar-C=C), 1258 (C=S), 1148 (N-N).	理论值: C, 47.42; H, 3.23; N, 13.82. 测定值: C, 47.63; H, 3.23; N, 13.82.	[M-H]⁻ 理论值: 405.0 测定值: 405.0
Wang-35	(DMSO-d₆, 400 MHz): δ 12.816 (s, 1H, NNH), 11.288 (s, 1H, NH), 10.771 (s, 1H, SCNH), 7.752-7.722 (m, 2H, J=4.8 Hz, Ar₁-H₄ and Ar₂-H₆), 7.501 (t, 1H, J=6.8 Hz, Ar₁-H₅), 7.425-7.330 (m, 2H, J=6.8 Hz, Ar₂-H₂ and Ar₂-H₅), 7.283 (t, 1H, J=7.6 Hz, Ar₂-H₃), 6.934 (t, 1H, J=6.8 Hz,	(DMSO-d₆, 400 MHz): δ 177.925, 162.704, 145.209, 139.922, 132.687, 130.145, 129.075, 126.433, 124.431, 124.199, 121.271, 120.579, 116.105, 115.907,	(KBr, υ/cm⁻¹) 3319 (NN-H), 3182 (CON-H), 3060 (Ar-H), 1696 (-CONH-), 1613 (C=N), 1575 and 1542 (Ar-C=C), 1198 (C=S), 1146 (N-N).		[M-H]⁻ 理论值: 438.9526 测定值: 438.9526

[0058]

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	Ar₂-H₄).	76.574.			
Wang-36	(DMSO-d_6, 400 MHz): δ 12.743 (s, 1H, NNH), 11.274 (s, 1H, NH), 10.490 (s, 1H, SCNH), 7.790 (d, 1H, J=7.2 Hz, Ar₁-H₄), 7.743-7.695 (m, 2H, J=8.4 Hz, Ar₁-H₆ and Ar₂-H₅), 7.300 (t, 1H, J=7.2 Hz, Ar₁-H₅), 7.145 (d, 1H, J=8.0 Hz, Ar₂-H₂), 7.009 (t, 1H, J=7.6 Hz, Ar₂-H₃), 6.926 (t, 1H, J=7.6 Hz, Ar₂-H₄), 3.860 (s, 3H, CH₃).	(DMSO-d_6, 400 MHz): δ 176.103, 162.734, 153.033, 145.101, 139.839, 132.174, 127.613, 126.914, 126.446, 124.229, 121.204, 120.389, 120.060, 111.729, 76.558, 55.773.	(KBr, υ/cm⁻¹) 3284 (NN-H), 3176 (CON-H), 3056 (Ar-H), 1689 (-CONH-), 1610 (C=N), 1544 and 1476 (Ar-C=C), 1253 (C=S), 1179 (N-N).	理论值: C, 42.49; H, 2.90; N, 12.39. 测定值: C, 42.43; H, 3.05; N, 12.66.	[M-H]⁻ 理论值: 451.0 测定值: 451.0
Wang-37	(DMSO-d_6, 400 MHz): δ 12.729 (s, 1H, NNH), 11.271 (s, 1H, NH), 10.775 (s, 1H, SCNH), 7.773-7.727 (m, 2H, J=8.4 Hz, Ar₁-H₄ and Ar₂-H₆), 7.342-7.272 (m, 4H, J=7.6 Hz, Ar₁-H₅, Ar₂-H₂, Ar₂-H₃, and Ar₂-H₅), 6.930 (t, 1H, J=7.6 Hz, Ar₂-H₄), 2.259 (s, 3H, CH₃).	(DMSO-d_6, 400 MHz): δ 177.186, 162.705, 145.053, 139.746, 137.326, 135.436, 132.100, 130.343, 128.398, 127.431, 126.272, 124.165, 121.391, 120.583, 76.480, 17.647.	(KBr, υ/cm⁻¹) 3304 (NN-H), 3240 (CON-H), 3057 (Ar-H), 1698 (-CONH-), 1611 (C=N), 1587 and 1541 (Ar-C=C), 1288 (C=S), 1152 (N-N).	理论值: C, 44.05; H, 3.00; N, 12.84. 测定值: C, 44.00; H, 3.05; N, 12.60.	[M-H]⁻ 理论值: 435.0 测定值: 434.9
Wang-38	(DMSO-d_6, 400 MHz): δ 12.806 (s, 1H, NNH), 11.305 (s, 1H, NH), 10.935 (s, 1H, SCNH), 7.798-7.783 (m, 2H, J=4.4 Hz, Ar₁-H₄ and Ar₂-H₆), 7.744 (d, 1H, J=8.0 Hz, Ar₁-H₆), 7.646 (d, 1H, J=8.0 Hz, Ar₂-H₄), 7.467 (t, 1H, J=8.0 Hz, Ar₁-H₅), 7.351 (d,	(DMSO-d_6, 400 MHz): δ 176.274, 162.748, 145.180, 139.969, 139.827, 132.644, 132.450, 129.978, 125.875, 125.077, 124.156, 124.054,	(KBr, υ/cm⁻¹) 3311 (NN-H), 3163 (CON-H), 3059 (Ar-H), 1696 (-CONH-), 1611 (C=N), 1589 and 1541 (Ar-C=C), 1236 (C=S), 1151 (N-N).	理论值: C, 39.45; H, 2.21; N, 12.27. 测定值: C, 39.25; H, 2.40; N, 12.07.	[M-H]⁻ 理论值: 454.9 测定值: 454.9

[0059]

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	1H, *J*=8.0 Hz, Ar₂-H₂), 6.940 (t, 1H, *J*=8.0 Hz, Ar₂-H₃).	121.187, 120.777, 76.599.			
Wang-39	(DMSO-*d₆*, 400 MHz): δ 12.753 (s, 1H, NNH), 11.281 (s, 1H, NH), 10.830 (s, 1H, SCNH), 7.812 (d, 1H, *J*=6.8 Hz, Ar₁-H₄), 7.737 (d, 1H, *J*=8.0 Hz, Ar₁-H₆), 7.359-7.286 (m, 2H, *J*=8.0 Hz, Ar₁-H₅ and Ar₂-H₆), 7.239 (d, 1H, *J*=8.0 Hz, Ar₂-H₄), 6.933 (t, 1H, *J*=8.0 Hz, Ar₂-H₃), 6.864 (d, 1H, *J*=6.4 Hz, Ar₂-H₂), 3.786 (s, 3H, OCH₃).	(DMSO-*d₆*, 400 MHz): δ 176.013, 162.745, 159.172, 145.061, 139.830, 139.436, 132.224, 129.133, 124.140, 121.291, 120.781, 117.543, 111.651, 111.109, 76.506, 56.214.	(KBr, υ/cm⁻¹) 3246 (NN-H), 3133 (CON-H), 3059 (Ar-H), 1700 (-CONH-), 1610 (C=N), 1539 and 1477 (Ar-C=C), 1207 (C=S), 1153 (N-N).	理论值: C, 42.49; H, 2.90; N, 12.39. 测定值: C, 42.65; H, 3.10; N, 12.13.	
Wang-40	(DMSO-*d₆*, 400 MHz): δ 12.725 (s, 1H, NNH), 11.277 (s, 1H, NH), 10.821 (s, 1H, SCNH), 7.806 (d, 1H, *J*=7.2 Hz, Ar₁-H₄), 7.732 (d, 1H, *J*=7.6 Hz, Ar₁-H₆), 7.440-7.417 (m, 2H, *J*=8.0 Hz, Ar₂-H₄ and Ar₂-H₆), 7.315 (t, 1H, *J*=8.0 Hz, Ar₁-H₅), 7.103 (d, 1H, *J*=7.2 Hz, Ar₂-H₂), 6.929 (t, 1H, *J*=7.6 Hz, Ar₂-H₃), 2.348 (s, 3H, CH₃).	(DMSO-*d₆*, 400 MHz): δ 176.166, 162.738, 145.036, 139.783, 138.237, 137.743, 132.127, 128.213, 126.799, 126.038, 124.129, 122.722, 121.328, 120.724, 76.501, 20.915.	(KBr, υ/cm⁻¹) 3304 (NN-H), 3225 (CON-H), 3076 (Ar-H), 1691 (-CONH-), 1610 (C=N), 1547 and 1480 (Ar-C=C), 1247 (C=S), 1181 (N-N).	理论值: C, 44.05; H, 3.00; N, 12.84. 测定值: C, 43..86; H, 3.27; N, 12.73.	理论值: 434.9776 测定值:/ [M-H]⁻ 434.9775
Wang-41	(DMSO-*d₆*, 400 MHz): δ 12.788 (s, 1H, NNH), 11.292 (s, 1H, NH), 10.913 (s, 1H, SCNH), 7.781 (d, 1H, *J*=8.8 Hz, Ar₁-H₄), 7.737 (d, 1H, *J*=7.6 Hz, Ar₁-H₆), 7.672-7.650 (m,	(DMSO-*d₆*, 400 MHz): δ 176.342, 162.737, 145.121, 139.900, 137.345, 132.486, 130.161, 128.325,	(KBr, υ/cm⁻¹) 3304 (NN-H), 3129 (CON-H), 3060 (Ar-H), 1696 (-CONH-), 1612 (C=N), 1591 and 1535 (Ar-C=C), 1240		[M-H]⁻ 理论值: 454.9230 测定值: 454.9232

[0060]

	2H, J=8.8 Hz, Ar₂-H₃ and Ar₂-H₅), 7.505-7.484 (m, 2H, J=8.4 Hz, Ar₂-H₂ and Ar₂-H₆), 6.933 (t, 1H, J=8.0 Hz, Ar₁-H₅).	127.312, 124.140, 121.215, 120.728, 76.584.	(C=S), 1159 (N-N).		
Wang-42	(DMSO-d₆, 400 MHz): δ 12.801 (s, 1H, NNH), 11.297 (s, 1H, NH), 10.906 (s, 1H, SCNH), 7.791-7.745 (m, 2H, J=4.0 Hz, Ar₁-H₄ and Ar₁-H₆), 7.634-7.628 (m, 4H, J=2.4 Hz, Ar₂-H₂, Ar₂-H₃, Ar₂-H₅, and Ar₂-H₆), 6.969-6.932 (m, 1H, J=6.8 Hz, Ar₁-H₅).	(DMSO-d₆, 400 MHz) : δ 176.307, 162.750, 145.145, 139.937, 137.806, 132.535, 131.270, 127.606, 124.165, 121.235, 120.752, 118.470, 75.565.	(KBr, υ/cm⁻¹) 3304 (NN-H), 3129 (CON-H), 3060 (Ar-H), 1696 (-CONH-), 1612 (C=N), 1591 and 1535 (Ar-C=C), 1240 (C=S), 1159 (N-N).	理论值: C, 35.95; H, 2.01; N, 11.18. 测定值: C, 36.13; H, 2.14; N, 11.11.	[M-H]⁻ 理论值: 500.9 测定值: 500.7
Wang-43	(DMSO-d₆, 400 MHz): δ 12.702 (s, 1H, NNH), 11.264 (s, 1H, NH), 10.783 (s, 1H, SCNH), 7.787 (d, 1H, J=7.2 Hz, Ar₁-H₄), 7.723 (d, 1H, J=7.6 Hz, Ar₁-H₆), 7.476-7.455 (m, 2H, J=8.4 Hz, Ar₂-H₃ and Ar₂-H₅), 6.997-6.976 (m, 2H, J=8.4 Hz, Ar₂-H₂ and Ar₂-H₆), 6.923 (t, 1H, J=7.6 Hz, Ar₁-H₅), 3.786 (s, 3H, OCH₃).	(DMSO-d₆, 400 MHz): δ 176.472, 162.726, 157.408, 144.971, 139.705, 131.965, 131.172, 127.228, 124.117, 121.359, 120.643, 113.573, 76.487, 55.264.	(KBr, υ/cm⁻¹) 3304 (NN-H), 3163 (CON-H), 3058 (Ar-H), 1695 (-CONH-), 1611 (C=N), 1538 and 1475 (Ar-C=C), 1248 (C=S), 1134 (N-N).	理论值: C,42.49; H, 2.90; N, 12.39. 测定值: C, 42.70; H, 2.67; N, 12.36.	
Wang-44	(DMSO-d₆, 400 MHz): δ 12.717 (s, 1H, NNH), 11.275 (s, 1H, NH), 10.819 (s, 1H, SCNH), 7.797 (d, 1H, J=6.4 Hz, Ar₁-H₄), 7.728 (d, 1H, J=7.6 Hz, Ar₁-H₆), 7.476-7.458 (m, 2H, J=7.2 Hz,	(DMSO-d₆, 400 MHz): δ 176.269, 162.736, 145.003, 139.749, 135.798, 135.441, 132.063, 128.856, 125.579,	(KBr, υ/cm⁻¹) 3306 (NN-H), 3165 (CON-H), 3126 (Ar-H), 1693 (-CONH-), 1612 (C=N), 1595 and 1536 (Ar-C=C), 1240 (C=S), 1153 (N-N).	理论值: C, 44.05; H, 3.00; N, 12.84. 测定值: C, 43.94; H, 3.26; N, 12.78.	[M-H]⁻ 理论值: 435.0 测定值: 434.9

[0061]

	Ar₂-H₃ and Ar₂-H₅), 7.242-7.224 (m, 2H, J=7.2 Hz, Ar₂-H₂ and Ar₂-H₆), 6.927 (t, 1H, J=7.2 Hz, Ar₁-H₅), 2.335 (s, 3H, CH₃).	124.122, 121.337, 120.699, 76.509, 20.624.			
Wang-45	(DMSO-d_6, 400 MHz): δ 12.759 (s, 1H, NNH), 11.798 (s, 1H, NH), 10.506 (s, 1H, SCNH), 7.792 (d, 1H, J=7.6 Hz, Ar₁-H₄), 7.551 (d, 1H, J=7.2 Hz, Ar₁-H₆), 7.328-7.284 (m, 2H, J=8.4 Hz, Ar₁-H₅ and Ar₂-H₅), 7.160-7.103 (m, 2H, J=7.2 Hz, Ar₂-H₂ and Ar₂-H₃), 7.013 (t, 1H, J=7.2 Hz, Ar₂-H₄), 3.863 (s, 3H, OCH₃).	(DMSO-d_6, 400 MHz): δ 176.114, 162.491, 153.024, 148.099, 145.877, 131.399, 129.331, 127.620, 126.908, 123.355, 122.859, 120.065, 118.081, 117.068, 111.733, 55.711.	(KBr, $υ$/cm⁻¹) 3314 (NN-H), 3178 (CON-H), 3077 (Ar-H), 1693 (-CONH-), 1600 (C=N), 1574 and 1483 (Ar-C=C), 1251 (C=S), 1161 (N-N).		[M+H]⁺ 理论值: 345.0821 测定值: 345.0817
Wang-46	(DMSO-d_6, 400 MHz): δ 12.806 (s, 1H, NNH), 11.292 (s, 1H, NH), 10.918 (s, 1H, SCNH), 7.790 (d, 1H, J=7.2 Hz, Ar₁-H₄), 7.729 (d, 1H, J=7.6 Hz, Ar₁-H₆), 7.633 (d, 1H, J=10.8 Hz, Ar₂-H₄), 7.524-7.439 (m, 2H, J=8.0 Hz, Ar₂-H₂ and Ar₂-H₆), 7.123 (t, 1H, J=7.2 Hz, Ar₁-H₅), 6.927 (t, 1H, J=7.6 Hz, Ar₂-H₃), 3.863 (s, 3H, OCH₃).	(DMSO-d_6, 400 MHz): δ 176.152, 162.736, 160.374, 145.154, 140.097, 139.943, 132.575, 129.959, 124.140, 121.261, 121.183, 120.784, 112.814, 112.137, 76.565.	(KBr, $υ$/cm⁻¹) 3301 (NN-H), 3163 (CON-H), 3055 (Ar-H), 1693 (-CONH-), 1611 (C=N), 1547 and 1524 (Ar-C=C), 1219 (C=S), 1147 (N-N).	理论值: C, 40.92; H, 2.29; N, 12.73. 测定值: C, 40.90; H, 2.15; N, 12.61.	[M-H]⁻ 理论值: 439.0 测定值: 438.9
Wang-47	(DMSO-d_6, 400 MHz): δ 12.755 (s, 1H, NNH), 11.288 (s, 1H, NH), 10.890 (s, 1H, SCNH), 7.778 (d, 1H, J=7.6 Hz, Ar₁-H₄), 7.740 (d, 1H, J=8.0 Hz,	(DMSO-d_6, 400 MHz): δ 176.720, 162.744, 145.091, 139.859, 134.734, 132.257,	(KBr, $υ$/cm⁻¹) 3247 (NN-H), 3164 (CON-H), 3059 (Ar-H), 1697 (-CONH-), 1610 (C=N), 1541 and 1478		[M-H]⁻ 理论值: 438.9526 测定值: 438.9529

[0062]

| | Ar₁-H₆),
7.615-7.582 (m,
2H, *J*=5.6 Hz,
Ar₂-H₃ and Ar₂-H₅),
7.298-7.255 (m,
2H, *J*=4.4 Hz,
Ar₂-H₂ and Ar₂-H₆),
6.936 (t, 1H, *J*=8.0
Hz, Ar₁-H₅). | 128.049,
127.965,
124.161,
121.283,
120.681,
115.260,
76.552. | (Ar-C=C), 1236
(C=S), 1152
(N-N). | | |

[0063]　　　　　　　　表3. 吲哚满二酮缩氨基硫脲类化合物的抗菌活性（MIC，μg/mL）

[0064]

化合物编号	MRSA Chaoyang	SA ATCC6538	VRE-309	BS ATCC 6633
Wang-1	0.39	1.56	3.13	≤0.78
Wang-2	25	>100	>100	>100
Wang-3	0.39	1.56	6.25	≤0.78
Wang-4	0.78	1.56	6.25	≤0.78
Wang-5	0.39	1.56	3.13	≤0.78
Wang-6	0.78	1.56	3.13	≤0.78
Wang-7	0.39	1.56	3.13	≤0.78
Wang-8	0.39	1.56	6.25	≤0.78
Wang-9	0.39	1.56	3.13	≤0.78
Wang-10	1.56	3.13	6.25	≤0.78
Wang-11	0.78	1.56	3.13	1.56
Wang-12	0.78	1.56	3.13	≤0.78
Wang-13	1.56	3.13	6.25	≤0.78
Wang-14	0.78	1.56	3.13	1.56
Wang-15	0.39	1.56	3.13	≤0.78
Wang-16	1.56	3.13	>100	1.56

[0065]

Wang-17	0.39	1.56	>100	≤0.78
Wang-18	0.39	0.78	6.25	≤0.78
Wang-19	0.78	1.56	12.5	≤0.78
Wang-20	0.78	6.25	>100	≤0.78
Wang-21	0.39	1.56	3.13	≤0.78
Wang-22	0.78	1.56	3.13	≤0.78
Wang-23	0.78	3.13	>100	≤0.78
Wang-24	0.39	0.78	6.25	≤0.78
Wang-25	0.39	0.78	3.13	≤0.78
Wang-26	0.39	0.78	1.56	≤0.78
Wang-27	1.56	3.13	>100	1.56
Wang-28	0.39	1.56	3.13	≤0.78
Wang-29	1.56	6.25	>100	≤0.78
Wang-30	25	>100	>100	25
Wang-31	0.39	1.56	3.13	≤0.78
Wang-32	0.39	1.56	3.13	≤0.78
Wang-33	0.39	3.13	3.13	1.56
Wang-34	0.78	6.25	>100	≤0.78
Wang-35	0.78	3.13	12.5	≤0.78
Wang-36	6.25	>100	>100	1.56
Wang-37	0.78	3.13	12.5	≤0.78
Wang-38	0.78	3.13	12.5	≤0.78
Wang-39	1.56	>100	>100	1.56
Wang-40	0.78	3.13	12.5	≤0.78

[0066]

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Wang-41	0.78	1.56	6.25	≤0.78
Wang-42	0.78	3.13	12.5	≤0.78
Wang-43	1.56	>100	>100	3.13
Wang-44	0.78	6.25	12.5	1.56
Wang-45	>100	>100	>100	>100
Wang-46	0.78	1.56	6.25	≤0.78
Wang-47	0.78	1.56	6.25	≤0.78
WJG-7	3.13	1.56	6.25	≤0.78
万古霉素	1.0	1.0	>16	0.5
甲氧西林	>200	3.13	——	——

[0067] 　　　　　　　　　　　　　　表 4. 吲哚满二酮缩氨基硫脲类化合物对临床分离的
MRSA 菌株的生物活性（MIC，μg/mL）

[0068]

化合物编号	309-4	6281	309-8	6-42	8-21	309-3	309-1	309-7	8-24	309-6
Wang-1	0.78	1.56	1.56	0.78	0.78	1.56	0.78	0.78	1.56	1.56
Wang-2	>100	>100	>100	>100	>100	>100	>100	>100	>100	>100
Wang-3	0.78	1.56	0.78	0.78	0.78	0.78	0.78	0.78	1.56	1.56
Wang-4	1.56	1.56	1.56	0.78	0.78	1.56	1.56	0.78	1.56	1.56
Wang-5	0.78	1.56	0.78	0.78	0.78	0.78	0.78	0.78	0.78	1.56
Wang-6	1.56	3.13	1.56	0.78	0.78	1.56	0.78	0.78	1.56	1.56
Wang-7	0.78	1.56	0.78	0.78	0.78	0.78	0.78	0.39	1.56	1.56
Wang-8	0.78	3.13	0.78	0.39	0.78	0.78	0.78	0.39	0.78	1.56
Wang-9	0.78	1.56	0.78	0.78	0.78	0.78	0.78	0.39	1.56	1.56
Wang-10	1.56	3.13	1.56	1.56	3.13	3.13	3.13	1.56	3.13	3.13

[0069]

Wang-11	1.56	3.13	1.56	1.56	1.56	3.13	1.56	1.56	1.56	3.13
Wang-12	1.56	3.13	1.56	1.56	1.56	1.56	1.56	0.78	1.56	1.56
Wang-13	1.56	3.13	1.56	1.56	1.56	3.13	1.56	1.56	1.56	3.13
Wang-14	1.56	3.13	1.56	1.56	1.56	1.56	1.56	1.56	1.56	3.13
Wang-15	0.78	1.56	0.78	0.78	0.78	0.78	0.78	0.78	1.56	1.56
Wang-16	1.56	3.13	1.56	1.56	1.56	1.56	1.56	1.56	3.13	3.13
Wang-17	0.78	3.13	0.78	0.78	0.78	0.78	0.78	0.78	1.56	1.56
Wang-18	0.78	1.56	0.78	0.78	0.78	0.78	0.78	0.78	0.78	1.56
Wang-19	1.56	3.13	1.56	0.78	1.56	1.56	1.56	0.78	1.56	1.56
Wang-20	1.56	6.25	3.13	1.56	1.56	3.13	1.56	0.78	1.56	6.25
Wang-21	0.78	1.56	1.56	0.78	1.56	1.56	1.56	0.39	1.56	1.56
Wang-22	0.78	1.56	1.56	0.78	1.56	1.56	1.56	0.78	1.56	3.13
Wang-23	0.78	6.25	1.56	0.78	1.56	1.56	1.56	0.78	1.56	3.13
Wang-24	0.78	1.56	0.78	0.39	0.78	0.78	0.78	0.39	0.78	1.56
Wang-25	0.39	1.56	0.78	0.39	0.78	0.78	0.78	0.39	0.78	1.56
Wang-26	0.78	1.56	0.78	0.39	0.78	0.78	0.78	0.39	0.78	1.56
Wang-27	3.13	6.25	3.13	3.13	3.13	3.13	3.13	1.56	3.13	3.13
Wang-28	0.78	3.13	1.56	0.78	1.56	1.56	1.56	0.78	1.56	1.56
Wang-29	1.56	6.25	3.13	1.56	3.13	3.13	3.13	1.56	3.13	6.25
Wang-30	>100	>100	>100	>100	>100	>100	>100	>100	>100	>100
Wang-31	0.78	1.56	0.78	0.78	0.78	0.78	0.78	0.39	0.78	1.56
Wang-32	0.78	1.56	1.56	0.78	1.56	1.56	1.56	0.78	1.56	1.56
Wang-33	0.78	3.13	1.56	0.78	1.56	1.56	1.56	0.78	1.56	1.56
Wang-34	1.56	6.25	1.56	0.78	1.56	3.13	1.56	0.78	1.56	6.25
Wang-35	1.56	6.25	1.56	0.78	1.56	3.13	1.56	0.78	1.56	3.13

[0070]

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Wang-36	12.5	25	12.5	6.25	12.5	25	12.5	6.25	12.5	25
Wang-37	1.56	6.25	3.13	0.78	1.56	3.13	3.13	1.56	3.13	6.25
Wang-38	1.56	6.25	6.25	3.13	6.25	3.13	3.13	3.13	3.13	6.25
Wang-39	6.25	25	25	3.13	6.25	12.5	6.25	3.13	6.25	25
Wang-40	1.56	6.25	1.56	1.56	1.56	3.13	1.56	0.78	1.56	3.13
Wang-41	0.78	3.13	1.56	1.56	1.56	1.56	1.56	0.78	1.56	3.13
Wang-42	1.56	3.13	3.13	1.56	3.13	3.13	1.56	1.56	3.13	6.25
Wang-43	6.25	12.5	6.25	3.13	6.25	12.5	6.25	1.56	6.25	25
Wang-44	1.56	6.25	1.56	0.78	1.56	3.13	3.13	0.78	3.13	3.13
Wang-45	>100	>100	>100	>100	>100	>100	>100	>100	>100	>100
Wang-46	0.78	3.13	0.78	0.78	1.56	1.56	0.78	0.78	1.56	1.56
Wang-47	1.56	3.13	1.56	0.78	1.56	1.56	3.13	0.78	1.56	3.13
WJG-7	1.56	1.56	1.56	3.13	3.13	6.25	6.25	0.78	1.56	6.25
万古霉素	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
甲氧西林	>200	>200	>200	>200	>200	>200	>200	>200	>200	>200

[0071]　　注：表 3 和表 4 中，菌株代号所表示的具体菌株可参考实施例 2 实验材料部分。