Short introduction
This factsheet looks into patent data of nearly 10000 Chinese companies and institutions active in the area of organic fine chemistry. It is a sizeable technology area in terms of patent applications in China, populated by well-known Chinese state-owned giants such as Sinopec and SinoChem as well as lesser-known companies. Companies filing patents in this category are predominantly petrochemical and pharmaceutical companies but there is also the occasional electronics or foodstuff company. With respect to academic institutions, both long established and upcoming Chinese universities and research institutes are active in this field. Besides looking at individual organizations, aggregated data are used to identify hotspots.

Where are the hotspots?
The top-10 cities with the most organic fine chemistry patent applications are marked with circles on the map below. Among the top-10, Beijing files the largest number of patents (841) followed by Shanghai (696). In the northern part of China, Beijing and neighboring city Tianjin clearly are the hotspots in this technology area. The other cities in the top-10 are concentrated in China’s east, including Shanghai and its surrounding cities alongside the east coast. The remaining two on the list are Chengdu in the west and Guangzhou in the south. A similar trend of geographical distribution can be observed in China’s fine chemistry industry. This industry has traditionally been concentrated in the Beijing and Shanghai regions and was recently ‘revitalized’ in the Yangtze river delta.
Who is filing?
43% of the patent applications in the field of organic fine chemistry between 2010 and 2012 are filed by domestic Chinese companies, state-owned and private. This is followed by applications filed by Chinese academic institutions, which account for more than 30% of the total. Foreign entities take a relatively modest share with 17% of all patent applications, or one third of the share of Chinese companies. Nevertheless, this indicates that foreign entities have interests in this technology field, either filing inventions that are the result of local R&D or protecting technologies developed abroad that require protection from Chinese competitors. The remaining 8% is filed by Chinese individuals. Individuals are very often employees of Chinese companies but file the patents under their own name due to favorable tax incentives.

Top-10 Chinese companies
The applications of the top-10 patent filing Chinese companies represent 7% of all organic fine chemistry patent applications. These companies are listed in the graph below. Among the top-10 companies, three are state-owned. The most prominent one is Sinopec Group, China’s largest oil and gas producer and number four on the Fortune Global 500 in 2013. This state-owned giant alone filed over 50% of the patents in the company top-10. Runner-up Zelang Group filed nearly three times less patents. This Nanjing-based company describes itself as China’s leading manufacturer of botanical, herb and plant extracts. Another state-owned giant, Sinochem, 113 on the Fortune Global 500, takes the fourth position. Both Sinopec and Sinochem are based in Beijing and both cover a wide range of businesses besides petroleum and petrochemical products. Apart from organic fine chemicals, Sinopec and Sinochem also file large numbers of patents in other technology areas, which is an indication of their innovative capability.

Many companies in the top-10 are concentrated along the Yangtze River Delta with only two exceptions. It is worth mentioning that four out of ten companies are based in the city of Suzhou nearby Shanghai where a national industrial park for chemistry was established recently. This coincides with the geographical distribution of China’s petroleum and chemistry industry, which is also concentrated in the Yangtze River Delta.
Top-10 Chinese academic institutions

The top-10 of Chinese academic institutes with the largest number of patent applications in the field of organic fine chemistry is listed in the graph below. The list shows a balanced mix of long established and upcoming Chinese universities and research institutes in the field of fine chemistry. Zhejiang University, no. 149 on the QS world university ranking for chemistry, filed the most patents among the top-10 institutes. Two other universities included in the QS ranking, Sichuan University and Nankai University, can also be found in the patent top-10. However, some well-known Chinese universities in chemistry, such as Peking University and Fudan University, are conspicuously absent. Institutes under the Chinese Academy of Sciences (CAS) are also missing from the top-10. The first CAS institute in the rankings is the Shanghai Institute of Materia Medica, in 18th position.

Conclusion

Domestic Chinese companies in the area of organic fine chemistry are highly active in filing patents, especially the state-owned giants. This to some extent shows their capacity in R&D and innovation. Sinopec emerges as a particularly dominant entity in terms of patent filings. It is also shown that the cities surrounding Shanghai are hotspots for the organic fine chemistry sector. This pattern coincides with the geographical distribution of the petroleum and chemistry industry. In recent years local governments of these cities have established a number of science parks and industrial zones and more are slated for construction.
The Netherlands Office for Science & Technology in China has published an overview article and twelve separate patent factsheets in the following areas:

1. Basic materials chemistry
2. Biotechnology
3. Electrical machinery, apparatus, energy
4. Macromolecular chemistry, polymers
5. Medical technology
6. Micro-structural and nanotechnology
7. Optics
8. Organic fine chemistry
9. Renewable energy generation
10. Semiconductors
11. Surface technology, coating
12. Transport and automotive

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